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JANUARY 1954

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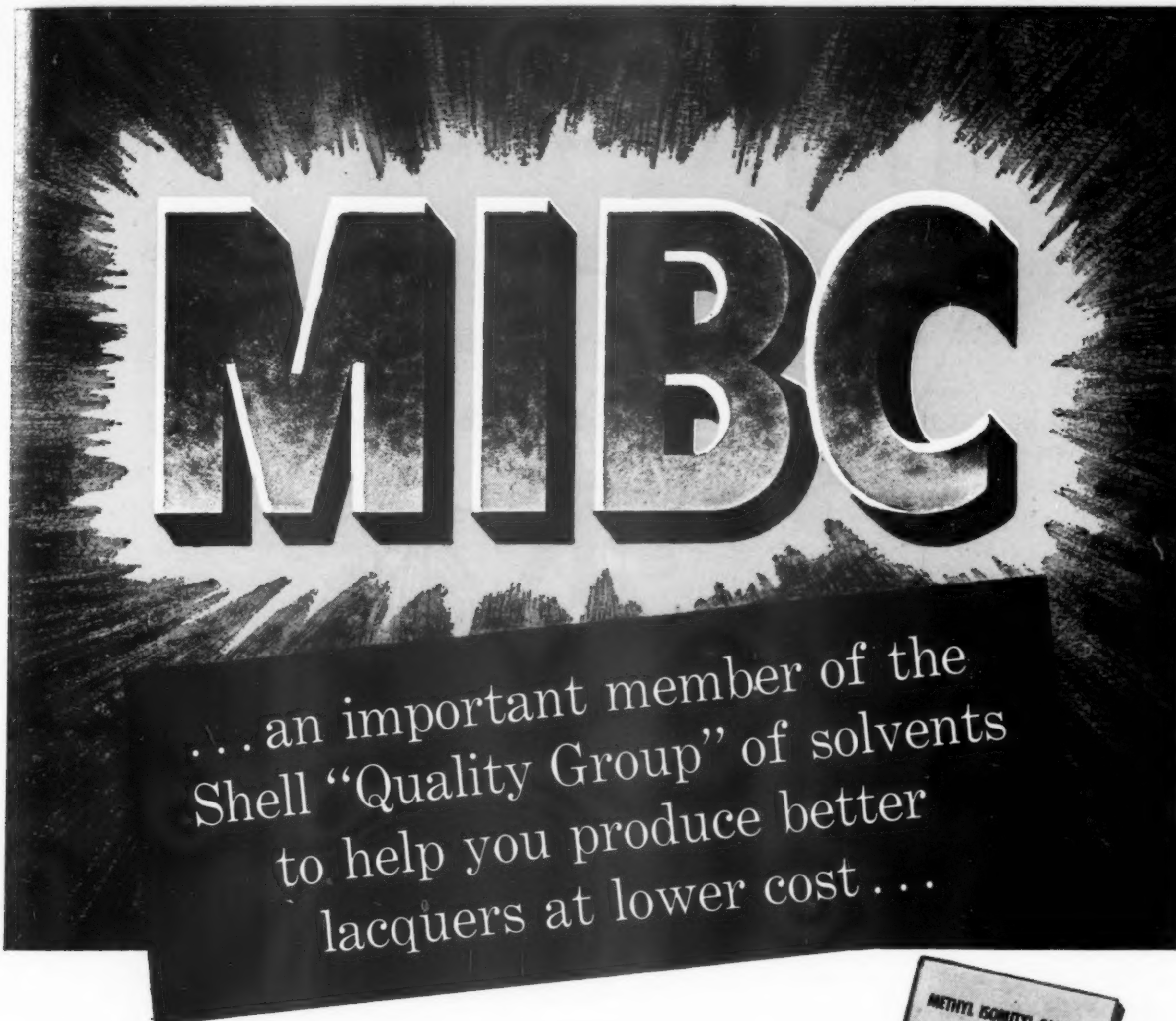

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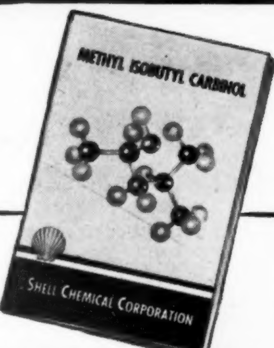

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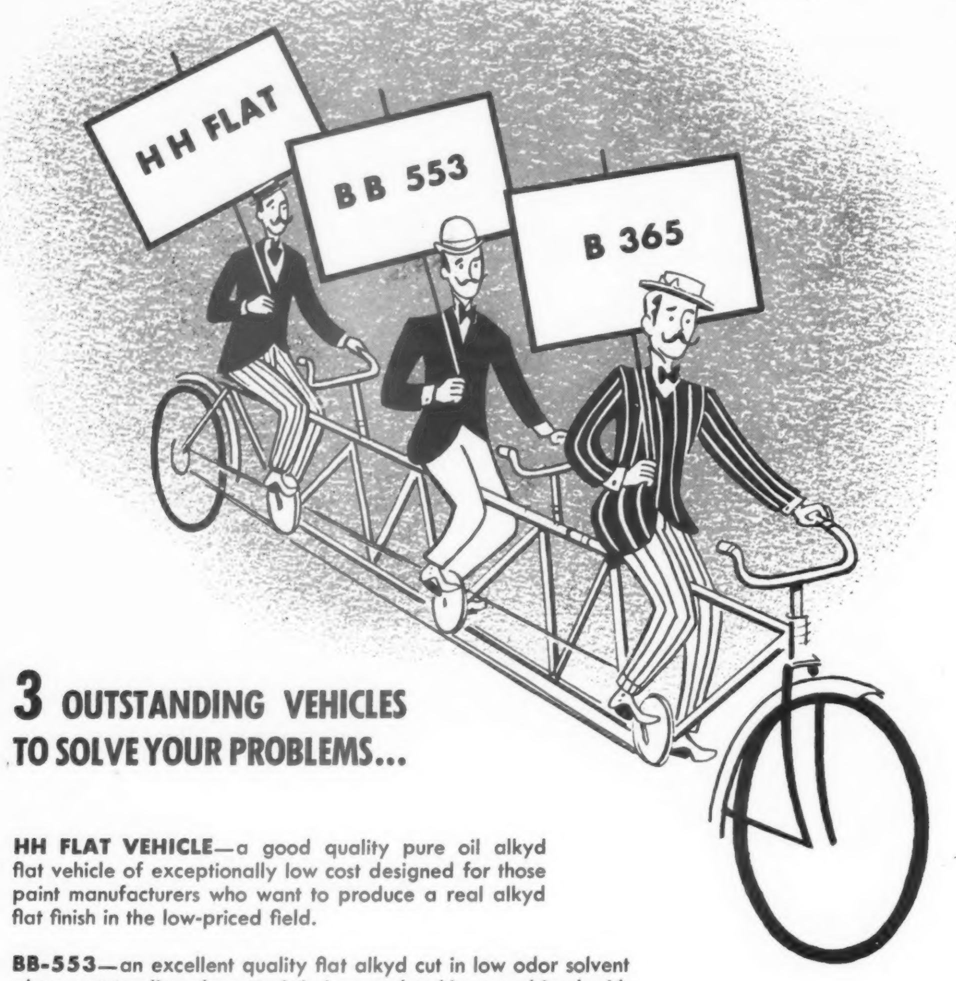

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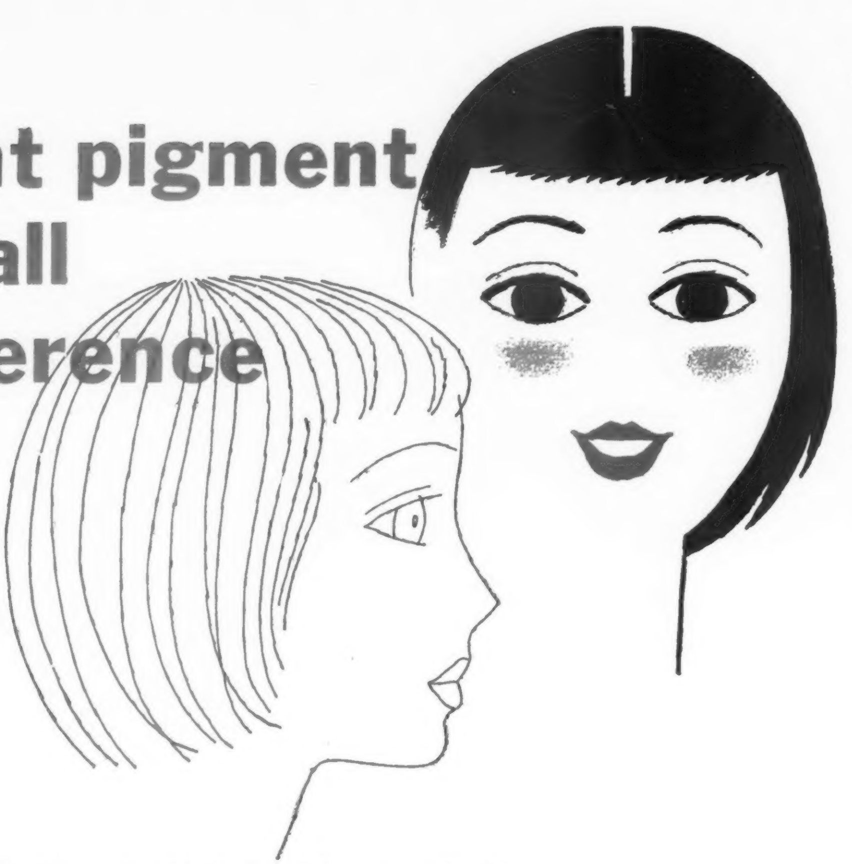

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Editorial Comment

Outlook for 1954

HARD selling coupled with a determined effort to lower costs in an increasing competitive buyers' market will be the antidote to any sharp dip in sales volume during 1954.

This is the consensus of opinion of the country's leading industrialists who generally feel that a gentle letdown in business activity is apt to occur during the first half of this year.

Other measures advocated—reduce production costs, step-up research and product development, modernize plant facilities, improve upon present processing methods and techniques, increase sales ffort, advertising and promotion.

Since production has caught up with demand, and surpluses are replacing supply shortages, the aim no longer is to boost production volume, but rather to lower operating costs and widen markets. This is the attitude taken by most industries.

For example, the chemical industry is looking forward to another peak year for 1954. This optimism is based on the fruits gained through research in providing new markets for chemicals, and in developing new applications for older lines. In order to maintain high volume sales, leading chemical companies are spending more on research and market studies than ever before. The emphasis is on process improvement, cost reduction, and new product development.

According to a recent report by the Commerce Department and the Securities & Exchange Commission, capital outlays in the first quarter are expected to reach a record of 6.490 billion dollars during the first quarter of 1954 as compared to last year's high of 6.147 billion during the same period. Broken down into specific industries, this report states that increased outlays have been planned for the machinery industry, fabricated metal products, automobiles and lumber products such as furniture, instruments, ordnance, etc.

Automobile manufacturers are planning to match or exceed 1953 expenditures for new plants, equipment, and modernization in 1954. One top auto executive predicts that production of passenger cars during the coming year would exceed five million.

In view of these developments, manufacturers of product finishes can anticipate another year of brisk activity. However, there is a growing challenge by manufacturers of plastics, porcelain finishes, and metal alloys who have made inroads in gaining some of the markets held by organic finishes. By continuous research and cooperation, suppliers of organic finishes can meet this challenge. The hot spraying technique of lacquers is a good example of the progress made in this direction. In this particular case, manufacturers of raw materials, suppliers of lacquer and hot spraying equipment worked together in producing a technique which today has gained wide acceptance throughout the finishing field.

Overall construction activity for 1954 is expected to decline very slightly—about 3 percent as compared with 1953. However, one million non-farming dwellings have been planned for 1954 while public works and utilities are expected to show a 7 percent gain.

With such a vigorous construction program planned, we can expect a high demand for trade sales products and maintenance finishes.

As was pointed out at the recent paint convention in Atlantic City, the raw material picture is most favorable. Some shortages do exist. Toluol and xylol have been comparatively tight but these are expected to ease considerably within the next month or two as new facilities are put into operation. Slight shortages have been experienced with epoxy resins and chlorinated rubber, but adequate supplies of these materials can be expected by the middle of the year.

Another encouraging factor is the complete removal of government allocation and controls which during the past year has provided a stimulus for increased research activity and product development. This has meant the introduction of new and improved coatings. Add to this the "Do-It-Yourself" market (which can mean a boost of 25 percent in trade sales alone), the increased purchasing power of the homeowner, expanded production of appliances, automobiles, furniture and other durable goods, and the paint industry can achieve another banner year in 1954.

How well you will share in this 1.5 billion dollar market depends on (1) how aggressive your sales force is; (2) how progressive your development laboratories are in creating new market for your products; and (3) how carefully your production department maintains the high quality of these products at a minimum of operating costs.


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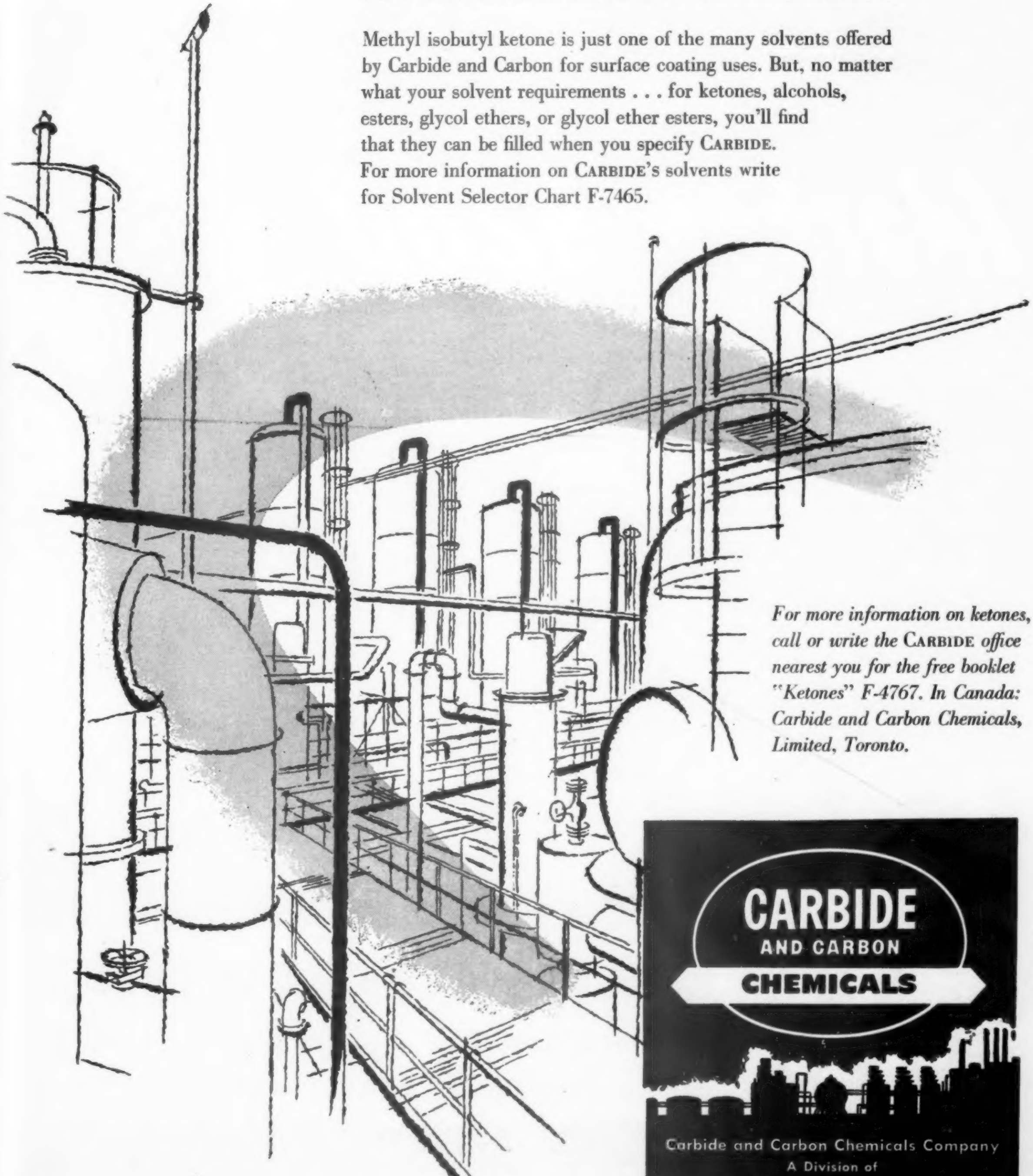

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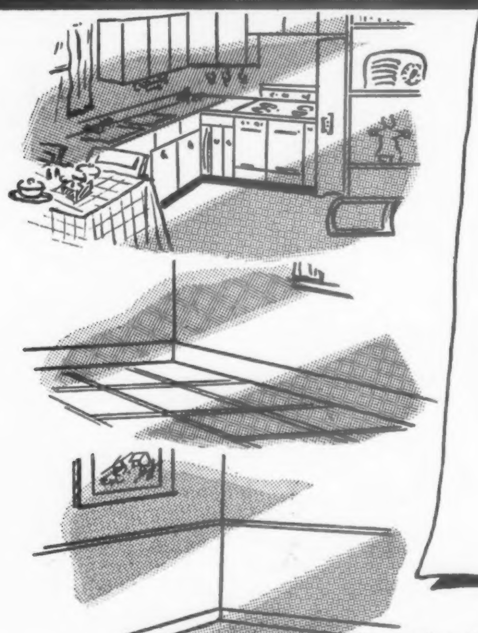

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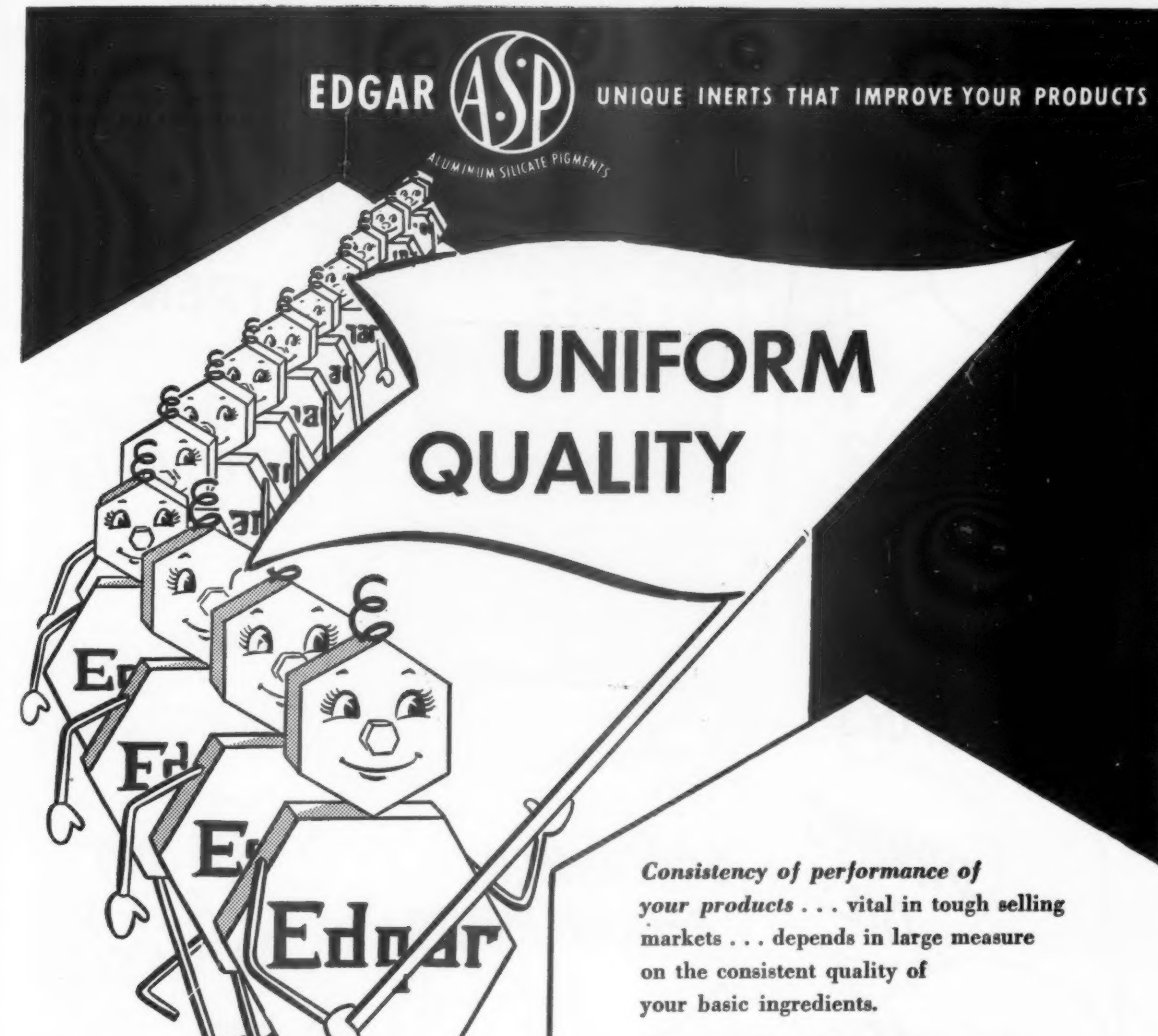
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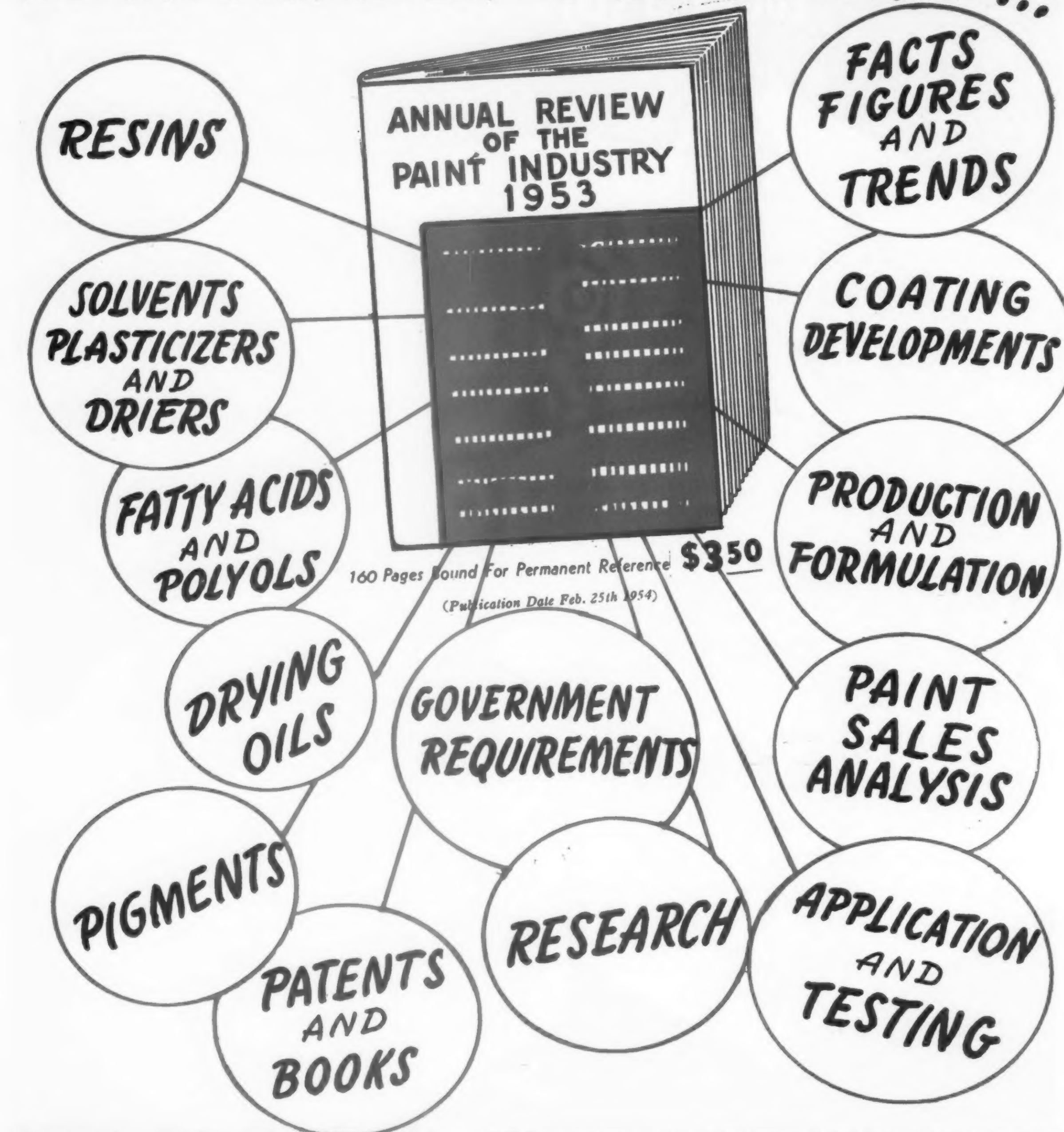

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1953 Highlights Of The Paint Industry*

THE MOST important development in the paint industry during 1953 was: The continuation of a new technical revolution of the industry. During 1953, this revolution broadened its base and increased its pace.

This present technical revolution already has a ten year history. But its growth in the last five years has been so apparent and so dynamic that it has unnerved large segments of the industry. The undercurrent of "change" has caused the industry to increase their research and development budgets. Unfortunately, however, much of this increased expenditure has not resulted in full value because the nature of the "change" has not been clearly understood.

This article represents a resume o' the 1953 Annual Review of the Paint Industry which is in the process of preparation for publication on or about February 15, 1954. This work is a one volume digest of the technical and commercial development in all phases of the paint industry. The business and government pictures together with new developments in raw materials, production, formulation, testing, and surface preparation will be discussed in detail.

Art to Science

During the past twenty-five or more years, the paint industry has been converting from a manufacturing art to an engineering and chemical science. As the technical knowledge grew and with improvements in raw materials, our industry increased its sales and expanded its markets. In fact this technical conversion of our industry has reached the stage where paint sales appear to correlate better with production of consumer goods than with the residential construction industry where paint has been historically classified.

This industry-wide development can be traced back to World War I. The close of this war found nitrocellulose production facilities far in excess of any peacetime consumption. Attempts to capitalize on these production facilities resulted in the development of lacquers. This development rocked the paint industry from its foundation as an "art." The age of paint technology began. With the development of alkyds, vinyls, epoxy, and other polymers, the industry moved forward on a broad front.

But a second revolution has been superimposed upon this basic conversion of the paint industry into a technical science. This second and current revolution has served to point out how shallow this first technical revolution has actually been for many of the paint producers. And it has been the subjective awareness by many companies that they do not understand what it is that is happening that has resulted in rather wide-spread indecision and even fear.

This second revolution has been the introduction of latex polymers. It struck the trade sale finishes with greater force than lacquers did on industrial finishes some twenty years ago. Since many companies had a much sounder base in paint technology than after World War I, they were able to capitalize upon this development much quicker. As a result, latex paints have been doubling in volume almost every year since their introduction. No longer are these materials considered a fad or the result of an advertiser's dream.

It is interesting to note the similarity of conditions that existed with the close of World War II. Again, a group of companies had manufacturing facilities available far in excess of expected peace time consumption. These companies, in general, complete strangers to the paint industry, found their markets in the paint

*This resume was prepared by George S. Cook of the Chemicals Div., General Electric Co.

industry. As a result, a whole new range of polymers have been made available. But what is more important: *It has been clearly demonstrated that the paint industry is a highly technical science.*

The second most important fact that latex paints has clearly demonstrated is that: *The paint consumer is willing to pay more for a product if he thinks he is getting a better product.*

The industry's direct answer to the introduction of latex polymers and paint has been:

1. A scramble to climb aboard the latex polymer skyrocket.
2. Extensive studies by all raw material producers on the performance of their products in conjunction with latex paints. This has resulted in development of auxiliary products (such as alkyd resins for latex paints) or new products (such as catalysts for latex paints).
3. The improvement of standard materials to offset this new class of vehicles (such as odorless vehicles and paints).

But hidden under the surface are the unanswered question that gives many troubled hours to the executives of the various companies. Some of these questions are:

1. What will be the next dynamic development that will upset my company's plans?
2. Is it safe any longer to consider only the "standard developments?"
3. Can I trust my competitors, any longer, to stick to the "tried-and proven?"
4. Must I establish a more fundamental group to explore the developments in fields somewhat unrelated to the paint industry?

General Developments

But, while latex may be the most dynamic development, the paint industry has not abandoned activity along its established lines, and rightly so. The fact that sales of paint brush cleaners has held up in spite of water paints and roller applications shows that the professional house painter has not lost business while the paint industry has increased their sales.

During 1953 changes in home mortgages to open-end mortgages was initiated. This will make it easier to finance repainting—but at the same time makes it easier to finance shingles or other refinishing methods. Another basic change of general importance occurred in patent law. Time and money spent on technical programs is more easily protected and capitalized upon.

The U. S. Department of Agriculture withdrew its official endorsement of Bulletin 804, which is a system for classification of house paints, because of advertising claims that could be construed as endorsement by the Department of particular brands of paint.

The U. S. Navy began to shut down its paint manufacturing facilities.

A union ban on the use of paint rollers was outlawed by the Detroit Circuit Court.

The use of effective labels on paint cans was shown to increase sales even when the brand name was "unknown."

Polymer Developments

The use of alkyd resins in paint manufacture has risen considerably faster than has the increased production of paints. By 1955, alkyd resin production is estimated will be 540 million pounds. Gas checking of alkyd films was reported to be due to ozone and could occur with simple carbon-carbon, double bonds. When phthalic anhydride was prepared from the oxidation of bicyclononadiene, it was established that raw materials for the production of phthalic need not be limited to aromatics.

The rapid growth of unsaturated polyester resins is due to two unusual characteristics, high reactivity and absence of volatile by-products during curing. Sales in 1950 were 7 million pounds, 1953 sales are estimated at 50 million pounds.

Several new polyols for resin and plasticizer design were made available. Pentaerythritol production is climbing to an estimated production demand of 70 million pounds by 1955.

The growing availability of various forms of solid formaldehyde improves the possibility of paint manufacturers making their own formaldehyde containing resins. New processes were developed for the manufacture of urea.

Urea resins plus DDT were reported to prevent fouling by barnacles for a period of two years. Introduction of potentially low cost diisocyanates has sparked interest in polyurethane polymers.

The secret for rapid hardening of phenolic resins was reported to be due to the position of the hydroxyl on the aromatic ring. Pure di- and tri-methylolphenol compounds were obtained.

A water-soluble modified phenolic resin splashed the headlines. A phenol-formaldehyde reaction product further reacted with an oil modified phthalic alkyd gains water solubility by being reacted with ammonia or an amide.

The necessity of protecting stainless steel from oxidation at temperatures over 1400 F. was illustrated by the protective qualities of silicon-aluminum coatings. Silicon-alkyd resins began to arouse greater interest.

The introduction of vinyltoluene makes a new class of coating films available. With improved and more efficient production methods developed, acrylics furnish new performance characteristics for the paint formulator.

The use of epoxy polymers is expanding in coatings, plastic pipes, laminates, and adhesives.

Ultrasonic methods were developed for obtaining better quality oils from seeds. Solvent extration methods were also improved. A steam-explosion process for fish oil polymerization was developed.

Fatty acids were being produced as a means of upgrading oils and other raw material sources of fatty acids. Plasticizers were obtained by producing synthetic hydroxylated fats using a modification of the peracetic acid process. A packaged-type plant was introduced for the continous splitting of fats by the smallest processor.

Polymerization methods using high energy electrons and ultraviolet light received promising performance. Success of emulsion polymerization in synthetic rubber has resulted in its use to polymerize practically all vinyl type compounds.

Miscellaneous Developments

With the introduction of dimethyl formamide, it became possible to obtain improved coloring

compositions having the combined advantages of pigments and dye solutions. Dimethyl formamide besides its unusual solvent ability for lacquers and vinyls may also be useful in dissolving heretofore insoluble pigments.

Competitive pressures have continued to spark carbon black producers to improve their manufacturing processes and to make their products available in more desirable forms. Small production plants were made possible that could make use of normally wasted flare gas from oil wells in order to make carbon black.

Micronized pigments continue their expanded use because of their ability to give better paints in less grinding time. A new technique for making ultramarine blues with high tinting strengths was developed. The television industry's need for better phosphorescent and fluorescent pigments has greatly enlarged the field.

The drying power of manganese and iron was found to be capable of being increased by complexing with a number of amines. The resulting monoamine obtains an electronic configuration identical to that of cobalt. This combined with lower energy requirements of electron transfer, accounts for the cases in which manganese monoamine was superior to cobalt in drying activity.

Also in the field of catalysts, odorless driers continued to be introduced along with special driers for silicone base resins and latex resins.

All the efforts by the industry to eliminate odor of its products does not prevent the continued additions to the list of odors that the manufacturer can actually add to his products.

The preparation of steel surfaces for painting began to make its shift from an "art" to a science with the issuance of a series of specifications defining the means and end-points for preparing the surface.

Synthetic paint brush bristles have been developed to the point where they even have the "flags" of genuine hog bristle.

Paint Developments

With the technological developments of the paint industry progressing to the point where it takes a highly trained specialist to control the purchase of industrial finishes, the timing was appropriate to propose a functional or scientific approach to the selection of protective coatings. The functional approach consists of attacking a problem from the standpoint of what is needed, instead of "trying on" arbitrary solutions until one fits. The functional approach consists of giving due consideration to the conditions of exposure, the necessary performance-appearance consistent within a price, and the selection of the most appropriate coating in light of these requirements.

The industry learned that *color* will sell paint. Mounting stocks of varied colored paints in multi vehicles prompted further development of tinting tube colors for base whites; and automatic color blenders for retail paint sales.

Paint manufacturers, still unsettled from the impact of latex paints on interior finishes, began to look at their exterior house paints with questioning eyes. It is evident that as current research programs are completed, this may well become one of the most dynamic and fluid areas in the paint industry.

Considerable work is being carried out in fire retardant finishes. Interest has been aroused by the extensive market that appears to exist.

Metal protective coatings are being studied in conjunction with cathodic protection. The use of organic coatings reduces the magnitude of cathodic protection required while the use of cathodic protection presents some unusual exposure conditions on the organic coatings.

The increasing use of cement and cinder block in industrial and residential construction makes consideration of coatings for these applications of greater importance. An organic coating was developed for the application to cinder block at the time of manufacture of the block which gives a porcelain-like finish.

Aerosol applied organic coatings has been a rapidly growing market for those firms who have solved the formulating problems.

Continued long range plans by the can manufacturers to use organic coatings in place of the frequently critical tin has continually enlarged this market for the paint industry.

Coatings for plastics has expanded to $2.5 million annual sales.

An insect killer capable of being added to paint was marketed.

An unusual method of packaging milk was offered. With this impetus, paper container manufacturers may increase their ingenuity in developing other packaging methods to replace glass and metal containers. This is of importance to the coatings industry since, it is, in many respects, the performance of the organic coating that will limit the applications.

Radioactive isotopes are serving the paint industry with a new tool to explore the basic fundamentals. As experience is gained by studying many of the standard problems with which the industry is always confronted, this approach will be useful in examining the more complicated problems of polymerization and oxidation.

Production Developments

More efficient vehicle manufacture is potentially possible by the developments of better methods of agitation as well as automatic methods of recording the progress of the chemical reaction.

Ultrasonics began to take an increasing role as a new method of agitation both in surface cleaning and in paint manufacture.

To aid the reduction of empirical know-how on mixing operations into more scientific facts, methods and types of mixing and mixers are being studied.

A ball mill was developed that may completely change the standard operation for ball mill grinding. By a designed process of continually interrupting or momentarily reducing the mill speed, it has been found possible to operate a ball mill at speeds up to 140% of the critical speed.

The use of strain guages for measuring pressure, flow, weight, level, shaft torque and power is being developed. These guages may offer the industry greater means of accuracy, control and reliability in addition to speed and efficiency than has been available in the past.

Tall Oil-Dehydrated Castor Oil Blends

—— FOR PREPARING INEXPENSIVE QUALITY VARNISHES

By T. C. PATTON*
W. LINDLAW*

HIGH quality varnishes with raw material costs ranging from 70 to 85 cents per gallon of finished varnish can be readily prepared by resorting to an insitu or uniphase** method of preparation and by using a combination of refined tall oil and Castung(R) 403 Z3 as the key varnish components. It is the purpose of this article to discuss proper techniques for preparing these economical quality varnishes and to report on their performance characteristics.

The combination of refined tall oil and Castung 403 Z3 (a bodied dehydrated castor oil) as varnish components represents a carefully balanced choice of raw materials. Thus tall oil contributes low cost raw materials, namely resin (rosin type) and fatty acids (roughly equivalent to soya acids), for esterification during the varnish preparation. Castung 403 Z3 contributes in several ways. As a fast bodying oil it greatly reduces the time of varnish preparation so that reasonable cooking times are obtained. To the finished varnish, Castung 403 Z3 imparts the properties of (1) flexibility (2) light color and (3) water resistance. This combination of tall oil and Castung 403 Z3 leads to inexpensive varnishes of high quality.

Supplementary raw materials employed in working out these low cost formulations are pentaerythritol, maleic anhydride, and 100% phenolic resin. Pentaerythritol was selected in preference to alternate polyhydric alcohols because of both price and superior performance. Thus at the time this article was written PE at 35 cents/lb. had a current (8-53) price advantage over glycerine of about 5 cents/lb. More important, however, is the fact that PE-derived resins generally give surface coatings with excellent water and weather resistance, higher gloss, better aging characteristics, shorter drying times, and harder and tougher films[1].

These insitu cooks, as prepared in the *Baker* laboratory, and based on over 40 cooks, give unexpectedly fine results, notably at 20 to 25 gallon oil lengths. The fast cooking times, light colors, and the excellent flex and water resistance that are achieved are considerably better than would be anticipated from a consideration of the raw materials themselves. It would appear that favorable synergistic effects are being obtained.

Two types of varnish, a maleic modified and a phenolic modified type, have been developed and will be considered in turn.

Esterification of tall oil with mono- and polyalcohols has been extensively discussed in the literature. A bibliography of pertinent references is summarized in a recent release[2] of the *Tall Oil Association*. From such background information, general principles of tall oil ester formulation become evident. The present article expands this information to cover the case where tall oil is extended and upgraded by admixture with a bodied dehydrated castor oil, Castung 403 Z3.

As can be seen by Table I on stoichiometric calculations, tall oil by itself gives but short oil-length varnishes. These tall oil varnishes suffer from several disadvantages. From a processing standpoint, long or excessive cooking times are required for commercially acceptable products. This, in turn, leads to low productivity and high labor and power costs, as well as heat degradation of the varnish product. Furthermore, the tall oil end product being a short oil length varnish, has limited flexibility, is dark in color and lacks water resistance. By upgrading the tall oil with Castung 403 Z3, processing times are dras-

*The Baker Castor Oil Company, Sales Service Department
**The terms "insitu" and "uniphase" are used interchangeably.
(R) Registered Trade Mark.

Table I

STOICHIOMETRIC CALCULATIONS

(BASIS: 1000 lb Tall Oil) (1)

Raw Material & Amount	P.E. Required	Water Formed	Product Formed (By Difference)	Oil Length (2) (For Tall Oil Only)	Pounds of Castung 403 Z3 "W" Required For Longer Oil Length "L"
TALL OIL (1000 lbs)	$\frac{36.2 \times 1000}{340} =$ 106 lb	$\frac{18 \times 1000}{340} =$ 53 lb	1053. lb	$\frac{527/7.85}{526/100} =$ 12.8 gal	$W = \frac{7.85 \times 526 (L-12.8)}{100} = 41.3x(L-12.8)$ (Ex: 504 lb Castung 403 Z3 for 25 gal O.L.)
RESIN ACIDS PORTION OF TALL OIL (1) (1000 lb x .50 = 500 lb)	$\frac{36.2 \times 500}{351} =$ 51.6 lb	$\frac{18 \times 500}{351} =$ 25.6 lb	526. lb	Resin and Acid portions of varnish computed separately to determine oil lengths.	
FATTY ACIDS PORTION OF TALL OIL (1) (by difference)	54.4 lb	27.4 lb	527. lb		
MALEIC ANHYDRIDE (4% based on Tall Oil) (1000 lb x .04 = 40 lb)	$\frac{36.2 \times 40}{49} =$ 29.6 lb	$\frac{9 \times 40}{49} =$ 3.3 lb	66.3 lb	$\frac{527/7.85}{592.3/100} =$ 11.3 gal	$W = \frac{7.85 \times 592 (L-11.3)}{100} = 46.5x(L-11.3)$ (Ex: 637 lb Castung 403 Z3 for 25 gal O.L.)
PHENOLIC RESIN (10% based on Tall Oil) (1000 lb x .10 = 100 lb)	——	——	100. lb (3)	$\frac{527/7.85}{626/100} =$ 10.7 gal	$W = \frac{7.85 \times 626 (L-10.7)}{100} = 49.3x(L-10.7)$ (Ex: 705 lb Castung 403 Z3 for 25 gal O.L.)

(1) Unitol S selected as a typical tall oil for illustrating calculations.
(2) Oil Length = gallons oil/100 lb resin.
(3) Product reacted.

tically cut, making possible the preparation of varnishes within a reasonable period of time and with excellent control. Furthermore, the medium to long oil length varnishes obtained are light in color, have excellent flexibility and hardness, and exhibit marked water resistance.

All this improvement is achieved at an increase in raw material cost of only some 20 cents to 25 cents/gallon. To a measurable extent this higher raw material cost is compensated for by savings made in labor and power as well as by higher plant productivity. In comparison with control varnishes made from soft oils, with commerical phenolic and maleic resins specifically designed for use with them, these tall oil/Castung 403 Z3 varnishes are fully equivalent in every respect. A maleic modified varnish will be first considered.

Maleic Modified Uniphase Varnishes

A series of maleic-modified varnishes was initially prepared in the laboratory at oil lengths ranging from 12 to 35 gallons using Castung 403 Z3 as the upgrading drying oil. Different percent maleic anhydride modifications were originally studied, and an optimum at 4% based on the tall oil established. At about 5%, the problem of gelation during processing became significant whereas at 3%, the advantages of the maleic anhydride modification were rapidly lost. No catalyst was used for preparing the varnishes nor was any catalyst found necessary. This checks the reported data of Mueller, Eness and McSweeny[3] on the preparation of tall oil esters, from which they concluded that within practical esterification temperatures, catalysts had no appreciable effect on the esterification rate of any of the alcohols studied.

Temperature Considerations

A processing temperature of 550°F was selected as optimum for the varnish preparation, representing a compromise between processing factors and end product performance. It has been shown[3] that no advantage in esterification is gained by use of a temperature higher than 560°F for pentaerythritol. At esterification temperatures much lower than 550°F, reaction of the polyols with rosin acids is unduly retarded. Thus Dunlap et al[4] discloses that at 180°C (356°F), the resin acids of tall oil are not appreciably esterfied although the fatty acid esterification is practically complete. At 250°C (482°F) and 275°C (526°F), the esterification rate for the resin acids becomes progressively more rapid. At the processing temperature of 550°F selected for preparing these insitu varnishes, the rate of reaction appears to be completely satisfactory.

Although research data[3] indicates that 10% excess polyalcohol (over the stoichiometric quantity required for esterfication) gives a maximum rate of reaction, exact stoichiometric proportions were used for preparing these maleic varnishes. Not only was excess polyol found unnecessary for the reaction, but the use of stoichiometric proportions is a definite advantage, for it is known that excess hydroxyl groups present in a protective coating only tend to lower the ultimate performance

	EFFECT OF ORDER OF ADDING CASTUNG 403 Z3	
	(1) Holdout at Beginning	(2) No Holdout
Processing Time at 550°F (hr.)	5.5	4.5
Flexibility, Kauri Reduction (%)	10.	30.
Alkali Resistance (minutes to failure)	20.	45.

Table II

Tall Oil/Castung 403 Z3 PE-Maleic-Varnish (20 gallon O.L.)

Tabulation of cooking time and flexibility and alkaline resistance properties.

of the product[5]. It is to be noted that whereas researchers tend to consider a reaction complete when a suitably low acid number is reached, varnish makers have to continue the reaction until an acceptable viscosity is achieved. Thus, for a straight tall oil varnish, an acceptable acid number may be reached at the end of three or four hours whereas, to obtain an acceptable viscosity, some twelve to sixteen more hours of processing may be required.

Addition of Ingredients

The order of adding the ingredients was found to have a profound effect on the performance of the end product. Contrary to the usual recommended practice,[6,7] it was found that in the case of Castung 403 Z3, the upgrading drying oil *should not* be held out at the beginning, that is, it *should not* be held out until after the maleic anhydride has reacted with the tall oil. Rather the Castung 403 Z3 should be first mixed with the tall oil, this to be followed in turn by maleic anhydride addition and reaction with the oil blend.

The usual order of addition is premised on the theory that it is preferable to form the rosin-maleic adduct rather than a mixed oil/rosin maleic adduct. It is theorized that in the presence of rosin and drying oil, and particularly a conjugated oil like Castung 403 Z3, the maleic anhydride should presumably react preferentially with the oil to yield a varnish of a lower quality ester gum type.

This study, which is based on practical rather than theoretical considerations tends to belie this belief and discloses that the reaction of maleic anhydride with the mixed oil/rosin mixture is a preferred procedure with a bodied DCO such as Castung 403 Z3.

By reacting the maleic anhydride with the tall oil/Castung 403 Z3 mix, three things are accomplished,—a) cooking or processing time is shortened, b) film flexibility is increased, and c) alkali resistance is improved. (see Table II).

The composition of the typical tall oil used in preparing most of these varnishes is given in Table III. Stoichiometric calculations for both maleic and phenolic modified tall oil/Castung 403 Z3 varnishes are given in Table I, which is self explanatory.

Properties

The properties of the tall oil/Castung 403 Z3 maleic varnishes are graphed in Figure 1. together with price and processing information. All varnish information given in the several graphs relates to varnishes having a "G" viscosity at 50% solids content in mineral spirits. In general the acid number of the varnish solids ranged between 2 and 8, with no value greater than 10, except for the straight tall oil varnish solids which had acid values on the order of 15 to 20. From an inspection of plotted data it is seen that an oil length range from 20 to 25 gallons is about optimum from an overall standpoint of price, processing and performance, with possibly a 20 gallon oil length being preferred. Note especially the marked reduction in processing time and the tremendous improvement in color, flexibility and water resistance which is achieved through the Castung 403 Z3 modification. Detailed information relating to this 20 gallon oil length maleic varnish is given in Table IV. The exact procedure for preparing these varnishes is given below.

Procedure

As noted previously, the procedure recommended here for the preparation of maleic modified uniphase varnishes differs from that usually suggested in the literature. However, our results indicate that this method of processing reduces overall cooking time, greatly simplifies the cooking operation,

Composition of a typical tall oil used in the preparation of these varnishes.

Table III

	PROPERTIES (1)		
Raw Material	Percent (by weight)	Acid Number	Combining Weight (2)
TALL OIL:			
Fatty Acids	50.	——	——
Resin Acids	43.	80/.50=160 (4)	351
Unsaponifiables	7. (3)	——	——
TOTAL	100.0	165	340
PENTAERYTHRITOL: (Pentek®)	——	——	36.2
MALEIC ANHYDRIDE	——	——	49.0

(1) Properties given here are for a typical tall oil (Unitol S) and calculations in Table I are based on this product.
(2) Combining Weight = 56,100/Acid Number.
(3) Unsaponifiables considered as part of resin acids portion of tall oil.
(4) Acid Number of 160 applies to resin acids portion of tall only. Acid Number of 80 applies to resin acids diluted with fatty acids portion of tall oil.

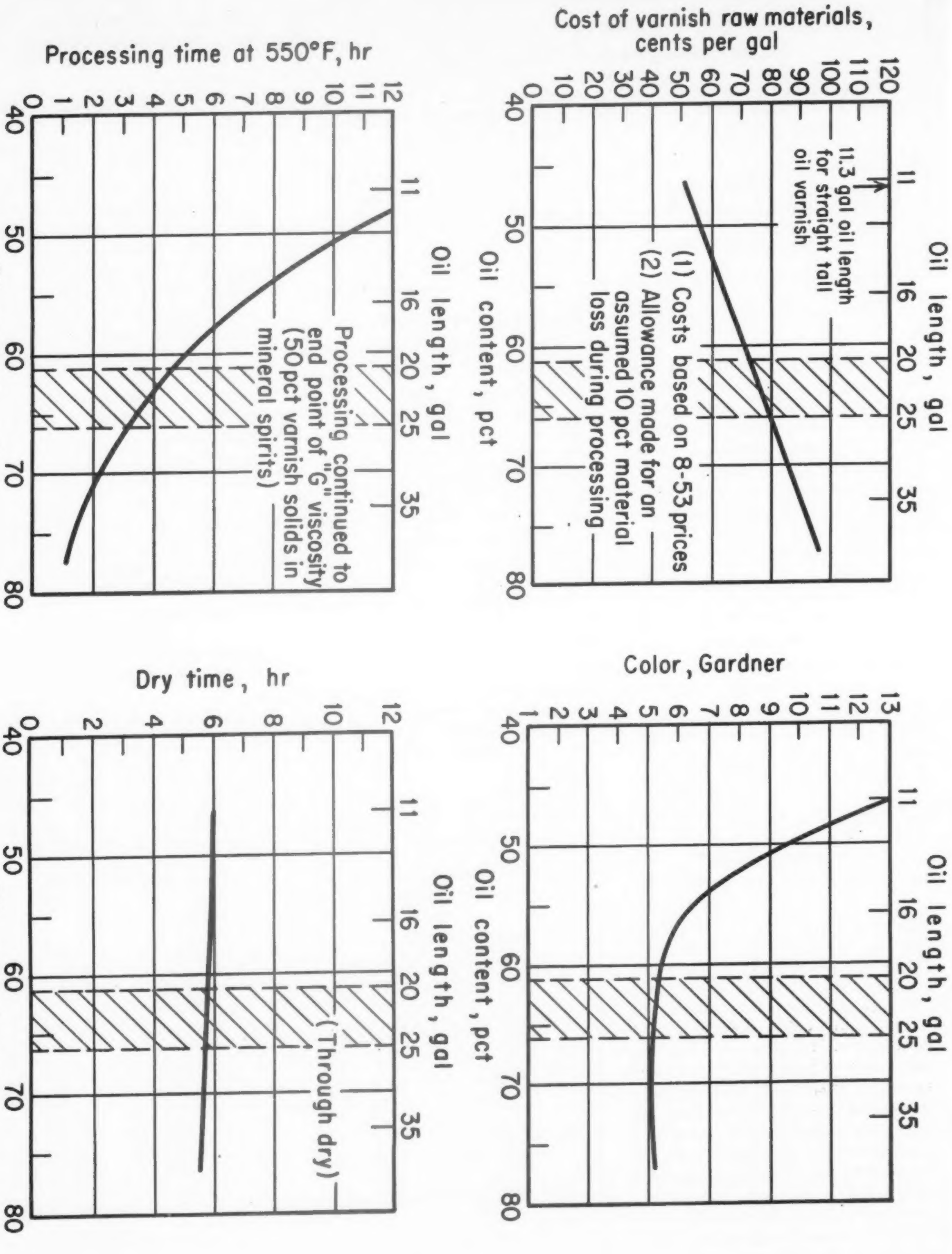

Figure 1. Graphs show the properties of the Tall oil/Castung 403 Z3 Maleic Varnish.

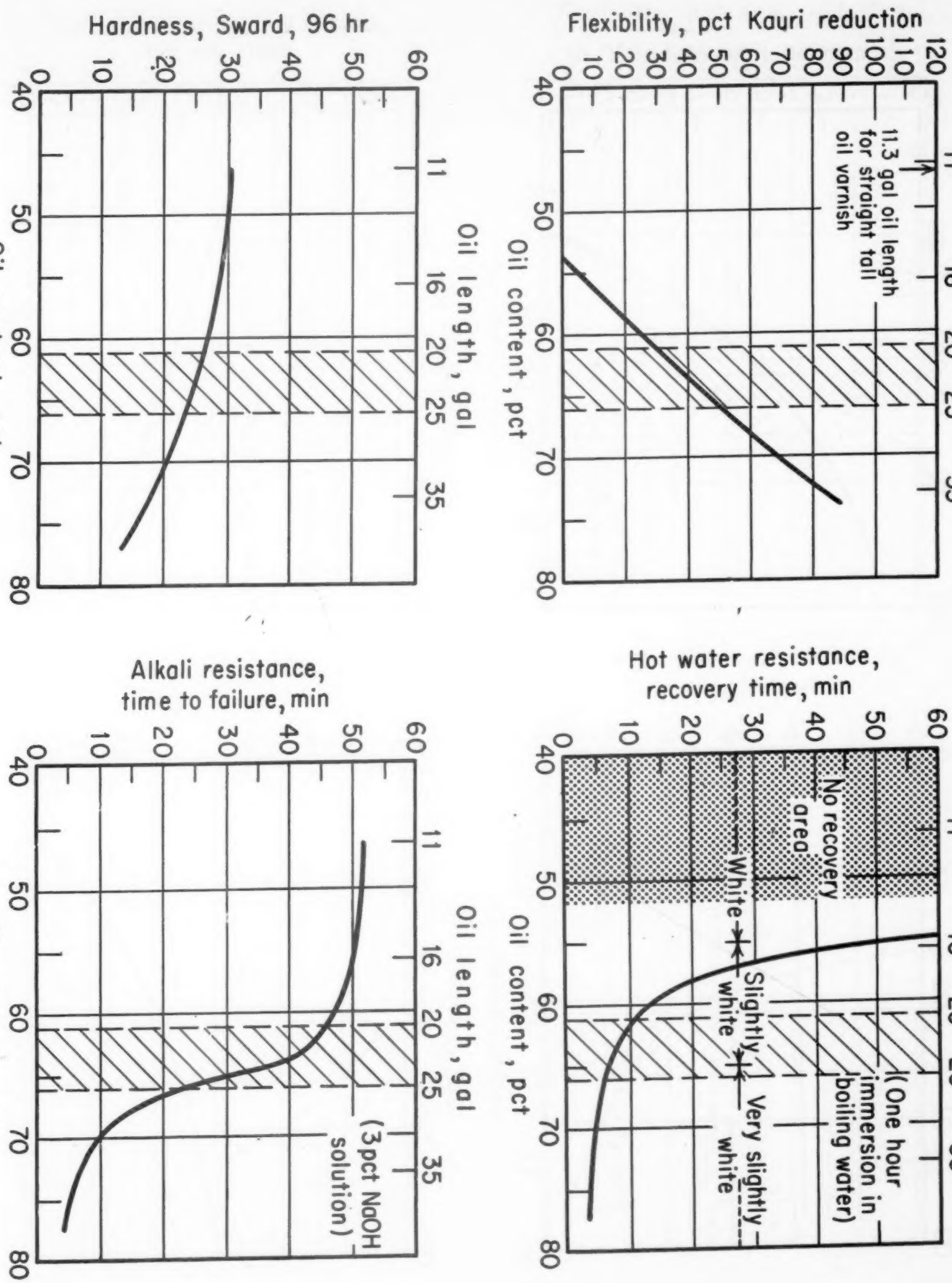

Figure 1 (cont'd). Graphs show the properties of the Tall oil/Castung 403 Z3 Maleic Varnish.

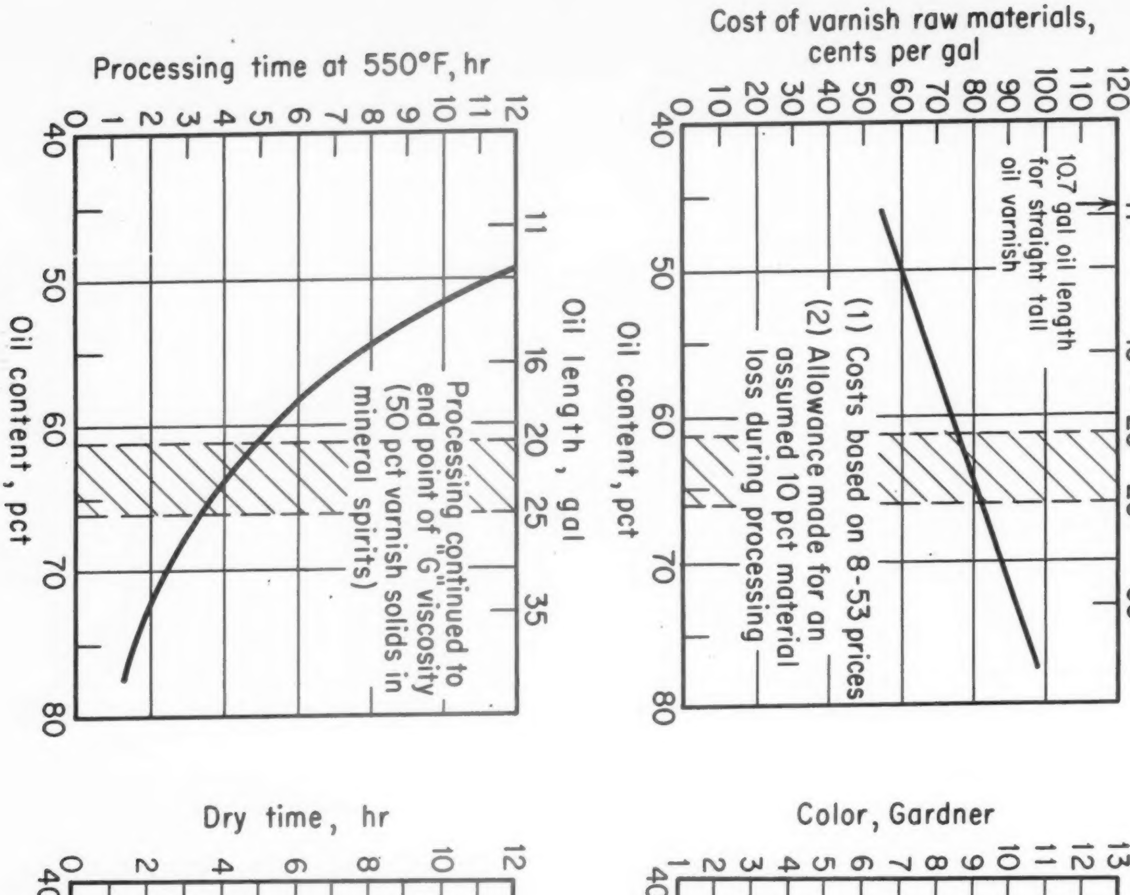

Figure 2. Graphs show properties of Tall oil/Castung 403 Z3 Phenolic Varnish.

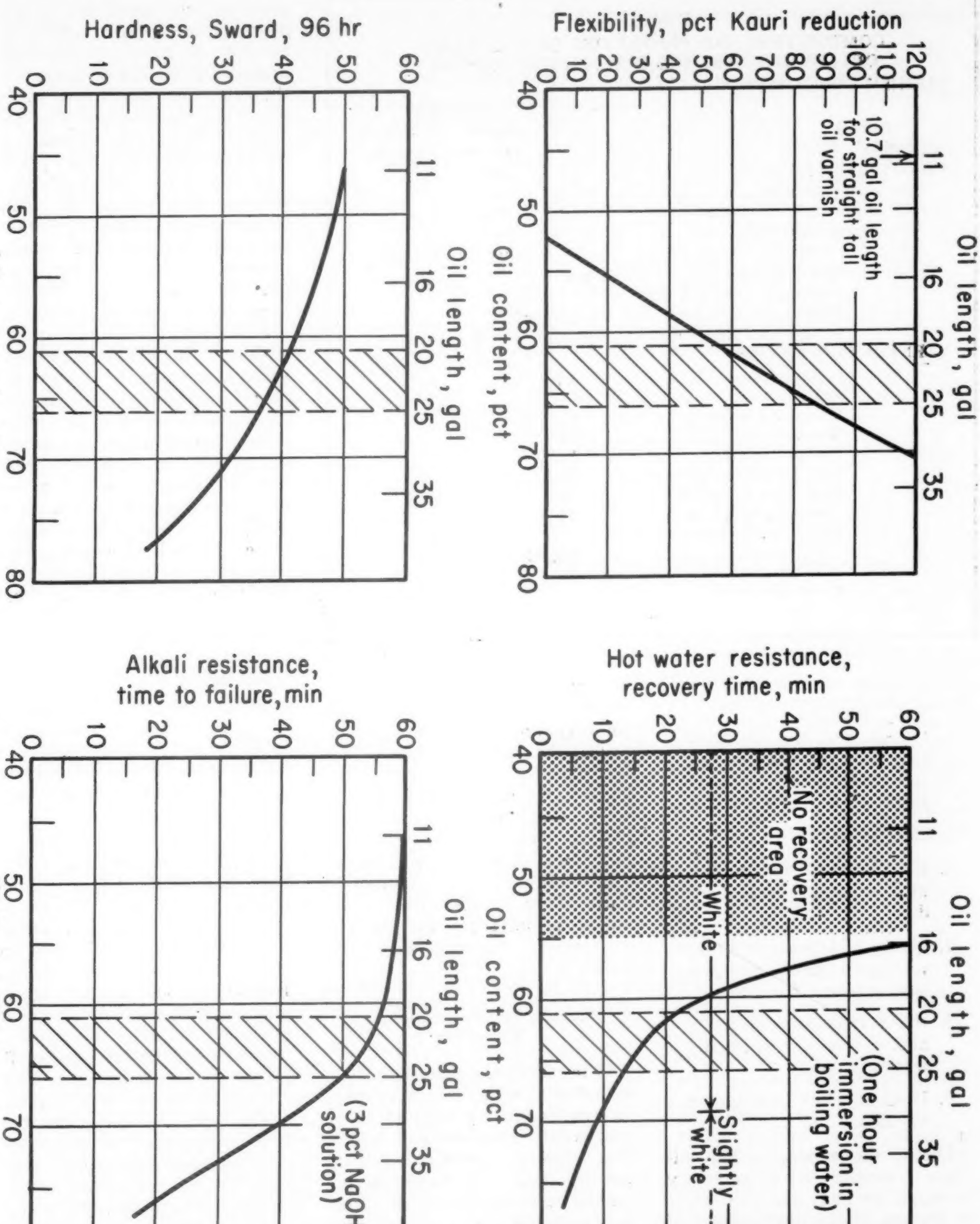

Figure 2 (cont'd). Graphs show properties of Tall oil/Castung 402 Z3 Phenolic Varnish.

Table IV

COMPOSITION AND PROPERTIES OF 20 GALLON OIL LENGTH TALL OIL/DCO MALEIC VARNISH

VARNISH COMPOSITION

Solids*	**BASIS** 1000 lb Tall Oil	**BASIS** Weight Percent
Tall Oil (Unitol S)	1000.	63.3
Castung 403Z3	405.	25.6
Pentaerythritol (Pentek)	136.	8.6
Maleic Anhydride	40.	2.5
Total	1,581. lb	100.0%

Raw Material Costs** 72c/gal

Processing Time at 550°F 4.5 hr

*Thinned to 50% solids with mineral spirits

**Assumes a 10% weight loss during processing

VARNISH PROPERTIES

Color, Gardner	5+
Acid Number	8
Viscosity, Gardner	G
Non-Volatile, (%)	50
Density (lb/gal)	7.4
Dry Time, Through (hr:min)	5:45
Flexibility, Kauri (%)	30
Hardness, Sward, 96 hr	26
Boiling Water Resistance, 1 hr	
Appearance	Slightly White
Recovery Time (min)	10.
Alkali Resistance	
Time to Failure (min)	45.

and produces varnishes with improved performance properties.

1. Charge the tall oil, Castung 403 Z3 and maleic anhydride to a "closed" kettle.
2. Heat to 450°F.
3. Hold at 450°F for 30 minutes to form a maleic adduct.
4. Slowly add pentaerythritol with good agitation to prevent excessive foaming.
5. Raise temperature to 550°F and commence sparging with inert gas.
6. Hold at 550°F for desired viscosity.

During the cooking of the uniphase varnishes it is necessary to supply an inert gas atmosphere to prevent undue development of color. The use of sparging is definitely recommended over the use of a simple inert gas blanket for two reasons. The sparging (a) helps to remove the water formed during esterfication and thereby accelerates the reaction process and (b) removes a considerable amount of volatile material which is either present in the tall oil at the beginning or which develops during the cooking cycle. The importance of (b) cannot be overemphasized, since failure to remove these volatile materials results in a slow drying varnish which is malodorous and permanently tacky. The condition is more noticeable when refined tall oil is used. The use of an inert gas blanket will not remove these volatile materials.

Phenolic Modified Uniphase Varnishes

In the study of modified phenolic varnishes, a series of varnishes at oil lengths ranging from 11 to 35 gallons was prepared and tested. The phenolic modification used was 5% and 10%, based on the tall oil, and two phenolic types were evaluated, (a) a heat-reactive phenolic syrup (BR-18036) and (b) a hard 100% phenolic resin (BR-9400).

The heat-reactive phenolic syrup that was selected was chosen as typical of the phenolic concentrates available at the time the study was undertaken. Presumably such a phenolic syrup should be a superior material for phenolic modification because of its reactivity under heat with the rosin present in the tall oil. The hard 100% phenolic resin selection was made on a basis of general trade acceptance and favorable pricing.

Of the two, the hard 100% phenolic resin required a simpler though longer cooking procedure. Substantially equivalent varnish performance was given by the two phenolic types except that the hard 100% phenolic resin varnishes gave consistently greater flexibility (higher kauri reduction values), whereas the heat-reactive phenolic syrup gave faster bodying varnishes for equal oil length and percent modification. In general, and based on considerations of cost, availability, ease of processing and varnish performance, the 100% hard phenolic resin appears to be preferred. This is somewhat fortunate, for BR18036 is no longer available (although other similar materials can still be obtained).

For a given resin, the higher percentage phenolic modification (10%) led to varnishes with shorter cooking times and enhanced film flexibility. Other properties such as dry, water resistance and alkali resistance were only slightly improved, if at all, with the higher phenolic modification.

Stoichiometric calculations for the phenolic modified tall oil/Castung 403 Z3 varnishes are self-explained in Table I. The properties of a series of tall oil/Castung 403 Z3 phenolic varnishes prepared using a 10% modification of BR9400 are graphed in Figure 2 together with price and processing information. All the varnish information given in the several graphs relates to varnishes having a "G" viscosity at 50% solids content in mineral spirits. In general the acid number of the varnish solids ranged between 2 and 8 with no value greater than 10 except for the straight tall oil varnish solids which had acid values on the order of 15 to 20. From an inspection of these plotted data, it is seen that an oil length range from 20 to 25 gallons is again about optimum from an overall standpoint of price, processing, and performance with possibly a 20 gallon oil length preferred.

Note especially the marked reduction in processing time and the great improvement in color, flexibility and water resistance which is achieved through the use of the Castung 403 Z3 modification. Detailed information relating to this 20 gallon oil length phenolic varnish is given in Table V. The procedure for preparing these phenolic varnishes is given below.

Procedure

The procedure for the preparation of the modified phenolic varnishes using the 100% phenolic hard resin is much simpler than when using a heat reactive syrup. Whereas the heat reactive syrup must be reacted with the tall oil before the Castung 403 Z3 is added, the 100% phenolic hard resin can be added in the very beginning along with the tall oil and the Castung 403 Z3.

1. Charge the tall oil, Castung 403 Z3 and phenolic resin to a "closed" kettle.
2. Heat to 420°F.
3. Slowly add the pentaerythritol with good agitation to prevent excessive foaming.
4. Raise temperature to 550°F and commence sparging with inert gas.
5. Hold at 550°F for the desired viscosity.

As with the maleic procedure, the use of inert gas sparging is necessary to remove the volatiles which form during the varnish processing and to inhibit color development.

Table V
COMPOSITION AND PROPERTIES OF 20 GALLON OIL LENGTH TALL OIL/DCO PHENOLIC VARNISH

VARNISH COMPOSITION

Solids*	BASIS 1000 lb Tall Oil	Weight Percent
Tall Oil (Unitol S)	1000.	60.0
Castung 403 Z3	459.	27.6
Pentaerythritol (Pentek)	106.	6.4
100% Phenolic Resin (BR-9400)	100.	6.0
Total	1,665. lb	100.0%

Raw Material Costs** 76c/gal
Processing Time at 550°F 5.0 hr
*Thinned to 50% solids with mineral spirits
**Assumes a 10% weight loss during processing

VARNISH PROPERTIES

Color, Gardner	9-
Acid Number	6
Viscosity, Gardner	G
Non-Volatile, (%)	50
Density (lb/gal)	7.6
Dry Time, Through (hr:min)	3:45
Flexibility, Kauri (%)	55
Hardness, Sward, 96 hr	42
Boiling Water Resistance, 1 hr	
Appearance	White
Recovery Time (min)	22
Alkali Resistance	
Time to Failure (min)	55

Distilled vs Refined Tall Oil

Although most of the work was based on a typical *refined* tall oil the use of *distilled* tall oil was also investigated. This *distilled* tall oil was found to be lighter in color and contained considerably less unsaponifiables than the *refined* tall oil. Moreover, this distilled tall oil had a much lower resin acid content (30-34% resin, 63-67% fatty acid). Hence, when esterfied with pentaerythritol, the resulting varnish ran to about a 25 gallon oil length, or with maleic modification to about a 22 gallon oil length. Therefore, to achieve a given oil length (say a 30 gallon oil length) with distilled tall oil, less additional oil is required than with refined tall oil. This represents a savings in raw material cost in favor of the distilled product when long oil length varnishes are being prepared.

However, the higher fatty acid content (of a soya acid type) of the distilled tall oil results in long cooking times and dark colors. Furthermore, and due presumably to the smaller amount of Castung 403 Z3 present, the flexibility of these distilled tall oil varnishes proves to be considerably less than varnishes of equivalent oil length prepared from refined tall oil. There was also some indication of reduced alkali resistance in the case of the distilled tall oil varnish. Drying time, water resistance and hardness were about the same (good to excellent).

In order to speed up the cooking time, and to improve the color, flexibility and other properties of the distilled tall oil varnishes, the resin acid content of the Acintol D was increased (percentagewise) by the addition of tall oil rosin. (Acintol R). A mixture of 80% Acintol D and 20% Acintol R was computed to be a composition roughly equivalent to that of a refined tall oil. Varnishes subsequently prepared with this 80/20 mixture were found to be equivalent in performance to those made from refined tall oil except that in the case of the maleic varnishes, very light colors were obtained using the mixed Acintols.

"Carbic" Resin Modification

A series of varnishes were prepared using BR17920, a resin, referred to as a "Carbic" type. Evaluation results are not reported here for three reasons: (1) the high cost of the Carbic resin, (2) the nominal performance of the prepared varnishes and (3) the poor viscosity stability of the finished Carbic varnishes (without driers).

Test Methods

The varnishes were tested in accordance with ASTM D154-47.

Conclusions

In recapitulation, it has been shown that inexpensive quality varnishes can be prepared insitu by using a blend of tall oil and Castung 403 Z3 in conjunction with PE, maleic anhydride and a hard 100% phenolic resin.

The oil length range best suited for developing these superior var-

(*Turn to page 72*)

Quality Control In The Paint Industry

PART III (Conclusion)

CONTROL OF
RAW MATERIALS AND FINISHED PRODUCTS

By LAWRENCE SHATKIN

THE FINAL analysis of raw materials rests with the laboratory technician and chemist. It is here where the final decision of questionable material is made. It is advisable for paint technologists and plant managers to know both the physical and chemical nature of the raw materials that are to be used in any protective coating, in order that they may be duplicated or guaranteed as to quality and workmanship.

There are many tests that are conducted to evaluate raw materials but not all are required to estimate the quality or characteristics of a routine kind of raw material. A few of the more common tests that prevail among small to medium sized companies in the paint field will be selected.

Let us consider briefly the following groups of raw materials.[1]

Pigments

In the greater majority of cases, physical analysis is the determining factor of the quality of the materials. Both organic and inorganic pigments are subjected to the following tests in most laboratories, where control techniques are a practice: (1) Weight per gallon, (2) Fineness—particle size, (3) Texture, (4) Oil absorption, (5) Tint, and (6) Strength

This is the last in the series of articles on Quality Control in the Paint Industry by Mr. Shatkin.
Part I appeared in the November, 1953 issue and dealt with statistical control. Part II appeared in the December issue and was concerned with acceptance and specifications of raw materials.

Weight per gallon

The weight per gallon expressed in pounds per gallon, furnishes the formulator with information to calculate the pigment volume concentration.

Particle size

The particle size has a direct bearing on the appearance and durability of the paint film. In addition, the stability of suspensions, the brushing properties and the permeability of paint films are associated with the size of pigment particle.

The tinting strength of pigments is related to the particle size. Thus, two samples of the same pigment which have the same brightness as measured by a standard tinting power test of one gram of the pigment to 0.1 gram of black may show differences in brightness if the 0.5 gram of black is employed. It would appear from such tests that the finer the particle size the greater the tinting strength. Since the number of particles per unit mass is directly proportional to the particle size, the greater the number of particles per unit mass, which are of sufficient size to produce complete hiding, the greater will be the tinting strength of the pigment.[2]

Texture

Texture of pigments refers to the hardness and possible shape of the individual particle rather than to the extent of subdivision. Thus, pigments may be finely divided and hard, or soft and finely divided, amorphous or any definite crystalline shape.

Texture of paints or enamels may be rough or smooth and it may be either hard or soft. Thus a pigment may have a hard texture and when ground into a paint the film may have a good (smooth) or poor (rough) texture.

Texture is a factor in grinding of pigments although the grinding of hard pigments may cause excessive wear on the steel rolls of a roller mill, yet the paint resulting from the dispersed pigment in the vehicle may have a good (smooth) texture. It does not necessarily follow that soft pigment, easily dispersed in a vehicle, will always produce smooth paint. Soft pigments may yield paints of poor (rough) tex-

ture. Some soft pigments disperse readily in vehicles, but upon aging in the container the dispersed pigment flocculates into hard aggregates (cohesive force between pigment particles is greater than the adhesive force between the dispersed pigment and the vehicle) which converts the mixture into a paint of poor texture.

In general, soft textured pigments disperse more readily, grind more easily, produce smoother paint films, have less tendency to settle hard or form aggregates, and make a paint which has a smoother texture, and spreads better than hard textured pigments. Pigments may disperse into (1) relatively uniform particle size, large or small, (2) great diversity in particle size, or (3) mostly small particles with a few large particles. The comparison of different lots of the same pigment will show the variation and character of the pigment. It will show the presence of larger particles. To be on grade, the pigment sample must show no more granular or foreign matter than the standard of comparison. For a sample to be judged "good", visible speck or agglomerates are few; to be judged "fair", the visible specks or agglomerates are more plentiful and interfere with the texture test; to be judged "poor", the specks or agglomerates make the texture test appear lumpy or rough; and to be judged "very bad", the texture test will appear extremely lumpy.[3]

The usual test for texture requires the use of a dispersing liquid. Liquids vary greatly in their dispersing characteristics. The same liquid which disperses one pigment easily may be found to be entirely unsatisfactory as a dispersing agent for other pigments. They may not disperse large agglomerates, or they may cause pigments to agglomerate or flocculate and form large hard particles. Since the liquid may be specific for a given pigment several liquids should be tested with each new pigment to determine the most appropriate dispersing medium.

The texture of pigments may be determined on a comparative basis in any laboratory with very simple equipment. While the results are not quantitative, they will serve as a guide to the paint grinder.

Oil absorption

Oil absorption is defined as the quantity of oil required to wet a definite weight of pigment to form a stiff paste. The oil absorption is expressed in pounds of oil per hundred pounds of pigment. The variations affecting experimental results of the oil absorption test are the oil itself, stiffness of the paste formed, duration and rigor of rubbing, temperature and humidity.

Oil absorption is related to the particle size, specific surface, interfacial tension, flocculation, the organophilic and hydrophobic properties, chemical reactivity and any other characteristic of the pigment particles.

The rub-out method for oil absorption has been adopted as the official test method by the *Federal Specification Board, TT-P-141a, June 1944*, and also by the *American Society of Testing Materials, D 332-T31.*

A brief description of the test involves: (1) weighing a definite amount of pigment, usually one to two grams, (2) adding from a burette graduated in 0.1 cc, drop by drop, alkali refined linseed oil with an acid number less than three, (3) after each oil addition, the pigment and oil are mixed very carefully with a spatula, and (4) the end point is reached, when enough oil has been incorporated with the pigment to produce a very stiff, putty-like paste.

Oil absorption is calculated from the following equation: $\frac{a.b.100}{100} = d$, in which "a" represents c.c.'s of oil, "b" the specific gravity of the oil, "c" the grams of pigment and "d" pounds of oil per 100 pounds of pigment.[4]

Mass tone and Tinting-Strength

The determination of mass tone and tinting strength go hand in hand. The mass tone is determined first, and a portion of this paste is used for the tinting strength test.

The prime requisites of these tests are thorough mixing of the pigment and the oil, accurate weighing of the paste, uniform mulling operations, and a method of viewing.

The author's experience has been to tie in oil absorption, mass tone and tinting strength in one operation. After the oil absorption has been determined, the paste is mulled, always remembering to give all samples as nearly equal treatment as possible. Then, a portion of the standard is spread over a glass plate. Adjacent to and just touching, the test sample is spread out. From the remaining paste, 0.1 gram is weighed very carefully. To this, two grams of a prepared zinc oxide paste is added. The material is stirred vigorously and carefully. When a uniform mixture is obtained, both the standard and test sample are spread over the same glass plate containing the mass tone results. At a glance one can view the mass tone and tinting strength.

Oils

There are several tests which have been used to investigate oils. Several have been standardized and are used to evaluate the quality of shipments of oil.

The tests which have been used include: (a) bulking value, (b) acid number, (c) iodine number, (d) saponification number, (e) ester number, (f) refractive index, (g) viscosity, (h) drying time, (i) color, (j) odor, (k) diene number, (l) thiocyanate number, (m) acetyl number, (n) carbonyl number, (o) peroxide number, and (p) chemical analysis,

The chemical analysis is an important tool in oil investigations but is entirely too slow and expensive for industrial utilization. The drying time, index of refraction, and gain in weight are related to the iodine number in that each is dependent upon the total unsaturation. The thiocyanate number, carbonyl number, peroxide number, acetyl number, and diene numbers are valuable for specific information but need not be of general application.

The usual tests conducted on oils at the Adelphi laboratories are: (1) Weight per gallon, (2) Acid number (3) Viscosity (4) Color, and (5) Odor

With certain oils, specific tests may be run. For example, a gelation test for tung oil is deemed necessary.[5]

Odor

There is no set rule with respect to odor. In general, experience has trained us to distinguish sharp differences in odor so that one can't mistake fish oil for linseed oil. Today, with odorless paints flooding the market, paint manufacturers are becoming more critical with respect to odor.

Color

The color of an oil is considered to be important in the manufacture of certain white and clear finishes. It also affects many delicate tints or shades. In some instances, it is unimportant as it may bleach. Color standard solutions have been set up for varnishes, oils, lacquers, resins, etc. The Gardner Color Standards are used by many laboratories as they furnish an easy inter-and intra-laboratory standard of comparison.

Weight per gallon

One of the most convenient methods to obtain the weight per gallon of a paint, paste or semi-paste, varnish or lacquer is to determine the weight of the material that is required to fill a standard cup which holds exactly 83.3 grams of water at 25±0.5°C.

The cup is weighed empty, and then filled at 25°C with the sample. The weight in grams of the sample multiplied by 10 gives the weight in pounds per gallon of the sample.

In using the cup, the sample at 25°C is added until the cup is almost full, the cover is then put in place and the excess sample which exudes through the hole in the cover is removed.

The specific gravity of the sample is conveniently obtained by multi-

plying the weight of the sample in the cup expressed in grams by the factor 0.012.

A Westphall balance is very useful in determining the specific gravity of oils which have a body of "C" (G.H. Scale) or less. The weight per gallon cup may be used for all types of oils.

Acid number

The acid number of any substance is defined as the number of milligrams of KOH which are required to neutralize the free or unreacted carboxyl groups, (-COOH) in one gram of the material under examination.

The acid number of an oil indicates to the user certain possible methods of utilizations, and certain chemical reactions which may effect its immediate and future stability, thus: (a) the reactivity with basic pigments is almost directly proportional to the acid number, (b) the soap and ester formation of the oil is not only an index of its reactivity but is also an index of the package stability of the finished product, (c) oils with high acid numbers may show considerable reactivity with substances having exposed amine groups. (d) carboxyl groups are polar. Since it has been shown that wetting and dispersion characteristics of pigments are related to the concentration of carboxyl polar groups, the acid number is an excellent indication of the oils expected behavior. (e) the water resistance of dried oil films and the gloss retention of oil vehicle films are almost directly proportional to the acid numbers, (f) the rate of polymerization of processed oils is influenced by the free acid groups, and (g) the acid number of bodied oils is influenced by the method of processing. Stored oils, lithographic oils and other bodied oils have decidedly higher acid numbers, unless blanketed with an inert atmosphere during processing. The increase in acid number is a function of the time, temperature, open or closed processing temperature, and other variables. Vaccue or gas blankets tend to minimize the increase in acid numbers.[6,7]

The acid number of oleo-resinous varnishes in many instances, furnish an indication as to the unexpected results or conditions encountered in their manufacture, storage, or utilization. (a) The free acid content of an oleoresinous varnish is quite often responsible for the change in viscosity; (b) A high acid number in varnishes is a warning signal of potential reactivity with basic pigments, which may be observed in the livering of pigmented enamels or other protective coatings in which they are used; (c) The high acid number of a varnish may result from the kind of gum used and its method of processing or its basic formulations; (d) The higher the acid number due to the free rosin present, the longer the oil length of the varnish that may be gas proofed; and (e) The higher the acid number of rosin-tung oil or ester gum-tung oil varnishes, in general, the longer the varnish may be boiled at the customary cooking temperature before it is placed in the kettle.

Thinners

The most important volatile paint and varnish thinners are:

Terpenes: Turpentine, Dipentine, Pine Oil, and Trade marked terpenes

Coal Tar Solvents: Benzol, Toluol, Xylol, and High Flash Naphtha

Petroleum Derivatives Mineral Spirits, V. M. & P. naphtha, Hi-solvency naphtha, and Kerosene

Miscellaneous Decalin, and Tetralin

A volatile solvent is an organic liquid which may be distilled without decomposition, capable of complete evaporation at atmospheric temperature, pronounced solvent action on oils, fats, waxes, without altering their chemical composition.

Specification of Thinners

Specifications of solvents and thinners are important to eliminate adulteration. They include: (a) Appearance—visual inspection in glass containers for clarity and freedom from suspended matter. (b) Odor—this is of considerable importance in determining its use. There is no means of describing odor accurately, at best only a vague idea is conveyed. (c) Color—most organic solvents are colorless when pure. Decided coloration indicates impurities, or if the substance is unsaturated it may indicate oxidation or polymerization. (d) Flash Point—the temperature at which the vapor produced will ignite if exposed to a flame.

Liquids are regarded inflammable if the flash point is below 150°F; "highly inflammable" if its flash point is within the atmospheric temperature of summer or below 86°F. (e) Blushing—rapid evaporation causes temperature to drop below dew point and causes deposition of moisture characterized by a milky film on lacquers and varnishes, which is caused by the precipitation of the resin. Hence, the importance of proper blending of solvents. (g) Freedom from residue—the thinner should be free from residue. It slows up the drying of the paint film. (f) Solvent power—thinners which have the same chemical composition and substantially the same distillation range may vary greatly in their ability to hold in solution varnish gums. The increasing use of synthetic resins of the phenol formaldehyde and glycerol phthalate dyes has intensified the importance of the solvent action. Many types of these resins are at least only slightly soluble in the usual types of petroleum thinners.[8]

Controlling Products Today

The quality control of a product does not stop at any point along the manufact ring process until the article, reaches the consumer. Even then a technical service organization acts as a lia son between the manufacturer and the purchaser.

During the last five years the writer has experienced changes in the control of the finished product. There was a time when viscosity was controlled by putting a butter knife into the paint and observing how the paint flowed off. As paint manufacturing became more complex and scientific in attitude and approach, the viscosity of paints were controlled by instruments. Today, the modification of the stormer viscometer by the addition of the stroboscopic timer provides a sturdy instrument which is more accurate, more quickly read, and suitable for both plant and control work as well as laboratory research.

During the last five years the author has endeavored to simulate conditions encountered in the field. That is the ultimate test of the coating. The information that one can gather from such field trips is invaluable.

Shingle Stains

Not too long ago shingle stains were controlled by merely taking a weight per gallon and brushing a square Morest card. This procedure was followed batch after batch. The control of the color of these items were not too good. The most important factor was overlooked. How did these paints compare in color, gloss, etc., over shingles? After all, these stains were to be applied over shingle boards. The control of color was taken a step further. After reviewing all formulas, it was decided that control of the vehicle was necessary in many cases in order to ensure color uniformity. Today, there are separate shingle boards maintained for each color, and as additional batches are produced, they are brushed along side of a control. The batch numbers and dates are recorded on the back of each brushout.

Flat Enamels

Extensive work in the field revealed that the one coat flat enamels must undergo a series of tests before the product could be passed. In addition to taking the weight per gallon, viscosity and brushout, the following tests were run: (1) The paint was brushed over a spackled surface with and without self priming; (2) The paint was brushed over a large plaster board to determine ease of brushing,

heen uniformity, and general ap-earance of the film; (3) A uniformity rawdown over various surfaces in-luding, shellac, paper, flat, flat over hellac, ceiling paint, ceiling paint over hellac, was made: (4) A vigorous brush-ut of the point was made to determine hether any rub-up occurred.

Before any flat enamels are passed, hey must meet all of the above re-uirements.

Continued research is being con-lucted in an effort to produce a paint hat will give excellent results over a patched wall which includes any and all types of surfaces. Recommended procedures for application were drawn up and distributed to dealers in an attempt to eliminate failures in performance and help limit the number of control tests necessary.

Semi-Gloss

In the semi-gloss line, the author determined experimentally that these brush-outs can be force dried without affecting the glo s. This facilitates the flow of production.

Asbestos shingle

Extensive work is being done with asbestos shingle paints, and every effort is being made to simulate field conditions.

Although the outlook is bright, constant control of the product must be maintained, and new ideas must be tried in order to keep pace with the changing economy.

The Human Factor

In spite of all that has been said concerning quality control of raw materials, materials-in-process, and finished items, the ultimate control of any of these procedures rests in the hands of the worker. How he performs his task will determine the quality of the product.

The periods of slavery and feudalism are past, and management has come to realize that man is human and can err in his decisions and work. The twentieth century ushered in the periode of scientific management. With this new concept arose problems of wage incentives, job classifications, job re-uirements, collective bargaining, merit atings, industrial relations and many others. With the mechanization of ndustry there arose the greater need or supervision because these techno-ogical advancements replaced the arti-an and craftsman, and the work was pt to become monotonous.

The growth of the paint industry arallels the growth of other types of hemical industries, and each general roblem becomes a specific one for the rotective coating industry.

Although money is very important to the wage earner, surveys and questionnaires have shown that the worker placed several factors before wages. These included recognition, opportunities for advancement, a friendly and cooperative atmosphere and a friendly boss.

To permeate these conditions throughout the plant, several things have to be done. The organizational set-up must show where each man fits into the picture. The worker filling paint, the labeler, the color matcher, etc., must be taught how to do their job properly, what is expected of them, and what part they play in the manufacturing process. Perhaps an orientation program will help bring the above points across.

Secondly, the worker must be told who is his immediate supervisor. This is the point where the chain is as strong as its weakest link.

The supervisor acts as a liaison between management and labor. He is an ambassador, and must get the cooperation of both parties. However, let it be known that the supervisor interprets and executes company policies, but does not determine them. It is at this point that communication must not only filter from top, down, but must be allowed to go from the worker to the hierarchy. Means of communications can be fostered through house organs, company bulletins, suggestion boxes, and labor-management conferences. These labor-management functions should not only occur when contracts are being negotiated, but periodically.

The promotion of quality consciousness in the mind of the operator is one of the most important problems to work on today if the time lag between the cause of the difficulty and its correction is to be reduced.

By emphasizing to all concerned the advantages resulting from high product quality, management may enlist the support of personnel in practices that mean the advancement of both the company and the employee.

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The Reaction Between Styrene and Unsaturated Fatty Acids*

PART III (Conclusion)

STUDY CONCERNS REACTION WITH COMPLEX CONJUGATED SYSTEMS

By DR. S. KUT

IN PART I of this series it was shown that the simple conjugated sorbic acid reacts with styrene to form simultaneously copolymers and a Diels-Alder adduct. The study is now extended to the reaction between the more complex doubly conjugated β-elaeostearic acid and styrene, as typical of the wood oil-styrene reaction.

Naturally occurring elaeostearic acid is the α or cis isomer, and is readily converted by heat and various agents into the more stable β-trans acid. The β-acid was used in this investigation since during the reaction, part of the α-acid could isomerise to the β-acid, and, though the copolymers would probably be indistinguishable, two different Diels-Adler adducts would be formed, assuming a similar reaction to that with sorbic acid. This could complicate the analysis. (c.f. Morrel and Samuels, 1932) who obtained two different Diels-Alder adducts from the α- and β-acids with maleic anhydride.

Pure elaeostearic acid being available, it was also used to test the Woburn Iodine method (Mikusch and Frazier, 1941; 1943). (See Part I). Using

> Part III, the last in the series, is concerned with a study of the reaction between styrene and -elaeostearic acid. Part I, which appeared in the November issue dealt with the reaction between styrene and sorbic acid. The December issue carried Part II of the series which covered a method for separating polystyrene from styrenated and non-styrenated drying oil fatty acids.

the 0.4N solution and reacting at 0°C it was found, as stated by the authors, that if about 10-fold excess reagent and a reaction time of 1-3 hours are employed, theoretical iodine values are obtained.

Reaction

Reaction was carried out by refluxing in xylene (1:1:2 concentration), under nitrogen. On heating the colorless components, the acid passed into solution, which became pale yellow, the color deepening as the temperature increased.

Like the reaction with sorbic acid, crystallisation occurred on cooling the solution during the initial period of reaction. The total reaction time was 140 hours. The final product was a yellow solution, with a viscosity of less than half a poise. Acid value of reaction product: 50.0 mgms. KOH/gm. Theoretical acid value (assuming no loss of solvent) is 50.4.

In attempting to separate any polystyrene that may have formed in the reaction by benzene extraction from an aqueous-alcoholic solution of the potassium soaps, practically all the latter were found to have dissolved in the benzene. The new procedure (see Part II) developed for separating polystyrene from the fatty acid products of reaction was therefore used in separating the products of reaction.

Separation of any free polystyrene from the styrene—drying oil reaction products by this conventional extraction method is therefore impossible not only because emulsions may be formed, as stated by Kappelmeier (1950), and as has also been observed in the examination of the conjugated linseed oil—styrene product (See Part II), but even more importantly, because of the solubility of the styrenated soaps in benzene (or other polystyrene solvent) under these experimental conditions.

Whether or not any appreciable

*From a Ph.D thesis 1951, University of London, London, England, by S. Kut. Dr. Kut is connected with Pearl Varnish Co., Ltd., Treforest Trading Estate, Pontypridd, S. Wales, Britain.

quantity of soaps are extracted by the aqueous solution will clearly depend on the particular product being examined. When appreciable quantities of unreacted fatty acids are present, one would expect these to be extracted (as the soaps) by the aqueous solution. But even in these cases, the analysis would be vitiated because of the solubility of the styrenated soaps in the organic solvent.

Separation of Products

The calcium chloride precipitation method described in Part II was applied very successfully to the reaction product, 99% of the fatty acids as measured by the carboxyl group being precipitated (carrying out a number of reprecipitations).

Non-precipitated residue: The polystyrene fraction. (Fraction F.2)

This represented 9.2% of the total solids, or 18.0% of the styrene, after allowing for the small amount of acid still present in this fraction. Acid value: 10.6 mgms. KOH/gm. Equivalent: 5270. Iodine, value 36.8.

Investigation of the precipitated fatty acids: Fraction F.1. The precipitated soaps were combined, acidified and extraction with ether yielding an almost clear viscous oil of equivalent 506.0 (acid value: 110.7)

From the weights and acid values of fractions F.1 and F.2, a mean acid value of 101.1 mgms. KOH/gm. of non-solvent reaction product was calculated. The theoretical acid value for a 1:1 styrene—elaeostearic acid product is 100.8 mgms. KOH/gm. Unlike the sorbic acid—styrene reaction there had, therefore, been no loss of carboxyl groups during the reaction between styrene and the β-elaeostearic acid.

The fatty acids obtained were separated by means of light petroleum into (a) a soluble oil and (b) an insoluble resin. The constants of the oil fraction are given in Table I. The theoretical figures being that calculated for a Diels-Alder addition product.

This fraction, which had a zero diene value showing the absence of free elaeostearic acid in the reaction product), approximated the constants required for a 1:1 elaeostearic acid—styrene Diels-Alder adduct, which was analogous to the sorbic acid-styrene Diels-Alder addition product. Due to a small solubility of the copolymers in petroleum, the constants of this β-elaeostearic acid-styrene adduct are not as good as those obtained in the sorbic acid experiments. Attempts to identify this fraction by dehydrogenation and oxidation of the dehydrogenation product failed as no more than a very small quantity of a mixture of acids was obtained, insufficient for identification. This is in line with other workers who have failed to obtain identifiable dehydrogenation products from dimeric drying oil fatty acids, which (presumably containing a cyclohexene ring) are analogous to the styrene—elaeostearic acid adduct.

Table I

	Observed	Theoretical
Equivalent	415.6	382
Iodine Value	113.7	132.9
Molecule Weight (Rast)	400	382
% C	80.72	81.68
% H	9.52	9.95
Refractive Index (17°C)	1.5273	—

Oil fraction constants.

The petroleum insoluble fraction (b), also of zero diene value, was fractionally precipitated from benzene with petroleum. The iodine values determined by the Woburn procedure were in all cases less than those calculated from the equivalents on the assumption of the loss of one double bond per elaeostearic acid molecule. The results obtained are shown in Table II the fractions being arranged in order of decreasing molecular weight.

Thus, the observed values are much lower than those calculated, being in most cases, of quite a different order. In the sorbic acid-styrene copolymers the discrepancy was much smaller, the values being of the same order. This is rather unusual, for higher values are generally expected in halogenation, due to addition and substitution.

Here one is dealing with complex molecules and further work may well be required to find correct reaction conditions and reagents to determine their unsaturation. It is possible that the low iodine values are due to some bromination at the carbon atoms formerly unsaturated (See Figure 1), the internal double bond is thus protected from addition, but if the substitution of the bromine is incomplete, less bromine than corresponding to one double bond will be used, and a low iodine value will therefore be obtained. Hydrogenation yielded even lower results (Adams catalyst in glacial acetic acid and ethyl acetate).

It is noteworthy too that the iodine value (Wij's 24 hours) of the β-elaeostearic acid—maleic anhydride adduct is about 8% less than the theoroetical value as found by Morrel & Samuels.

In the study carried out, the Woburn method which yielded theoretical iodine values for elaeostearic acid was used for the products, in order to determine whether the triconjugated system was still present.

Oxidation of Addition Compound

The isolation of benzoic acid from the oxidation of the supposed Diels-Alder compound would give no conclusive evidence of its structure, but since the dehydrogenation—oxidation experiments had yielded no definite results, this oxidation was attempted. However, neither alkaline (at elevated temperatures and at 0°C), nor neutral permanganate (20°C) yielded more than a trace of product. This was rather surprising in view of the recent work of Petit and Fournier (1950) who had reacted styrene and α-methyl styrene with linseed oil at high temperatures. From their reaction product they isolated a 1:1 linseed fatty

Iodine values of fractions arranged in order of decreasing molecular weights.

Table II

The styrene β-elaeostearic acid copolymers.

Equivalent	Observed Iodine value (gm I/100 gm)	Calculated Iodine Value
647.4	40.5	78.4
1073	30.3	47.3
703.2	39.6	72.2
500	80.1	101.6

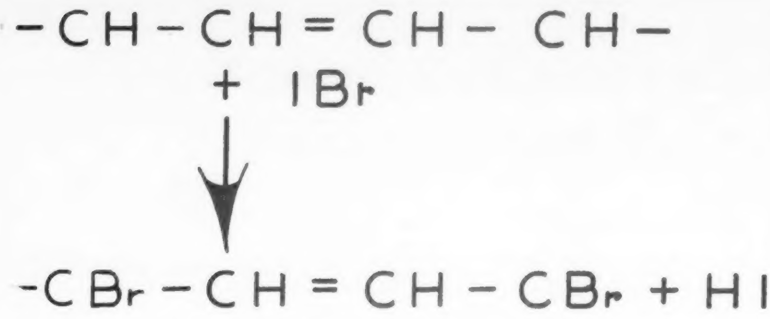


Figure 1. Reaction shows possible bromination of carbon atoms.

acids-styrene adduct, which yielded benzoic acid on alkaline permanganate oxidation. These authors, therefore, suggested that at the high temperature, the linseed oil fatty acids had isomerised to their conjugated isomers, which with styrene gave a Diels-Alder adduct. If this were so, one would expect the β-elaeostearic-styrene adduct to yield benzoic acid on oxidation. In view of this contradiction, the corresponding 1:1 sorbic acid-styrene adduct (of definitely known structure) was oxidised with alkaline permanganate at 0°C. As yield, only a small amount of impure acid (m.p.appx. 66°C) was isolated. Hence the 1:1 sorbic acid-styrene adduct like the β-elaeostearic acid—styrene adduct, did not yield benzoic acid on oxidation.

It would appear then, that Petit and Fournier's 1:1 compound may have had a different structure, which did not lead to the complete destruction of the molecule under these conditions of oxidation.

The analysis of the β-elaeostearic acid-styrene product indicate that as in the sorbic acid-styrene reaction, a Diels-Alder aduct is formed simultaneously to copolymers of β-elaeostearic acid and styrene, and it is suggested that the copolymers are again formed in a similar manner as in the styrene-sorbic acid and styrene-butadiene reactions.

By analogy with the sorbic acid—styrene reaction, one can suggest the following structure (I) for the β-elaeostearic-styrene 1:1 adduct, using the configuration of the β-acid-maleic-anhydride adduct (II) determined by Morrel and Samuels (1932) which showed the portion of the β-elaeostearic molecule which takes part in the Diels-Alder condensation (See Figure 2). The styrene in I could of course have also added in the opposite direction. By similar analogy, the 1:1 adduct formed with the cis, α-elaeostearic acid would be III and/or IV.

As for the sorbic acid reaction, the elaeostearic acid—styrene copolymers are no doubt also formed by a normal free radical reaction. In comparing the elaeostearic acid and sorbic acid copolymer, it must be borne in mind that the former copolymers contain relatively less styrene because in both experiments the same concentrations by weight were used. In the case of sorbic acid, this involved a nearly equimolecular ratio, while in the elaeostearic acid case about 2.7 molecules of styrene to one of the acid.

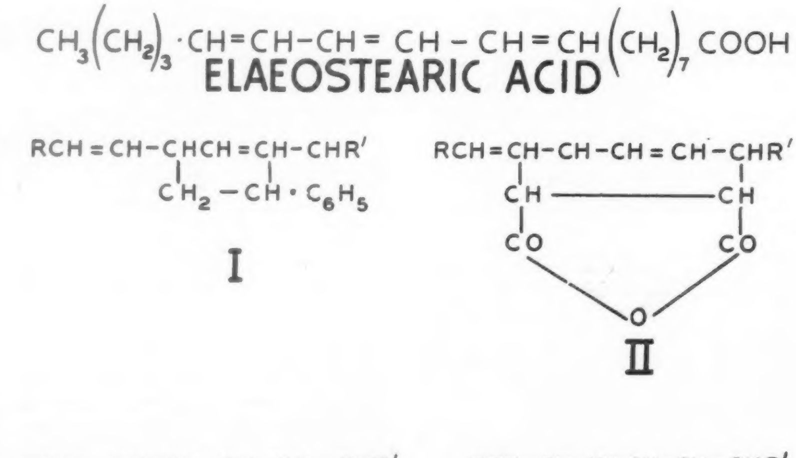
Polystyrene Fraction.

The free polystyrene in the sorbic acid reaction was only 3-4% whereas that in the elaeostearic acid case was 9%. Due to the greater molecular excess of styrene in the latter case, one would expect a greater proportion of polystyrene to be formed. Since the equivalent of this polystyrene fraction (in the elaeostearic acid—styrene reaction product) was much higher than that of any of the isolated elaeostearic acid copolymers, and furthermore it being a semi-solid, it seems likely that the major portion of this fraction consisted of free polystyrene.

The high iodine value of this polystyrene fraction is perhaps rather surprising. Using the same reagent (0.4N Woburn) a high value had also been observed in a prepared low molecular weight polystyrene. Furthermore, since a strong halogenation reagent was used, other reactions, apart from addition may have taken place. Whitby (1936), Staudinger & Steinhofer (1935) have also reported on the unsaturated nature of polystyrenes, whereas Risi' Gauvin (1936) considered the low boiling polystyrene polymers to be saturated. It appears (Burke & Grummit, 1943) that the question of the nature of the end groups in vinyl polymers has not yet been satisfactorily investigated, due to the difficulty of detecting one double bond in a large molecule.

In contrast to the sorbic acid-styrene reaction, no loss in acidity occurred in the elaeostearic acid-styrene reaction. This is probably due to the position of

Figure 2. Possible structures of reaction product of styrene and elaeostearic acid.



the double bonds, and, therefore, the points of reaction, being much further removed from the carboxyl group than in the case of the sorbic acid, where the carboxyl group itself is conjugated with the butadienoid system.

Copolymerisation of Isomers

Since in the study of the elaeostearic acid—styrene reaction the more stable β-isomer was used, while the natural acid is the α-form, it is pertinent to discuss whether there is any difference in the reactivity of cis and trans isomers in copolymerisation.

According to Mayo and Walling (1950), one would anticipate in general that the less stable, energy-rich isomer of a pair might be the more reactive, assuming that both isomers of reaction are presumably converted through very similar (at most steroisomeric) intermediates into the same free radical. Some evidence for this expectation has been found. Contrary results obtained with the dialkyl fumarates and maleates are ascribed as due to steric factors.

Possible polar effects in the Diels-Alder cyclisation and in the copolymerization have already been discussed with reference to the reaction between sorbic acid and styrene (Part I). In the case of elaeostearic acid, a polarized form could arise only by virtue of relatively weak inductive effects. Such weak effects may account for the slower reaction of elaeostearic acid with styrene, though it is quite possible that such polarizations are of little significance in this case, and that a non-directed free radical reaction and cyclisation may occur.

Conjugated Drying Oils

The nature of the reaction will no doubt be similar with the fatty acid chains of the triglycerides as for the simple acids. Some modifications may be expected due to steric factors. Reaction involving the triglycerides may, under certain conditions of reaction, lead to the formation of three dimensional copolymers and gelation may occur due to cross linking. This is in fact observed in the reaction of styrene with the tri-conjugated wood and oiticica oils. In addition, the natural vegetable oils contain a number of minor constituents such as antioxidants and photosensitive pigments that may have some kinetic effects on the copolymerization.

The slightly faster rate of reaction which has been observed for oiticica oil with styrene as compared to wood oil, could be due to a small inductive influence of the carbonyl group, facilitating the reaction in the terms discussed in Part I (Polar effects.)

As far as the mechanism of copolymerization is concerned, experimental evidence has been obtained for the mechanism originally suggested by Hewitt and Armitage (1946) for conjugated fatty acids. The reaction has been shown to be of the free radical type in the case of conjugated acids, and Rinse and Korf's ionic mechanism (1949; 1950) can certainly be rejected for the conjugated acids. The catalysis of the styrenation reaction by anthraquinone and other proton acceptors, reported by Rinse and Korf, could possibly be due to their catalysing the simple Diels-Alder addition, a reported action of donor or acceptor molecules (Kloetzel, 1948).

Experimental

The β-elaeostearic acid was prepared by the isomerisation of tung oil to β-elaeostearin by iodine in ethyl acetate (Morrel, Marks & Samuels, 1933), and saponification of the isolated β-triglyceride. The β-acid was obtained as a white solid (m.p. 71°C.), after recrystallization from alcohol.

Equivalent: 280 (calculated 278); Diene value (following the Ellis-Jones procedure (1936): 91.56 (calculated: 91:31). Hydrogenation value: 276 calculated 273.9) %C: 77.85, %H 11.11, calculated for $C_{18}H_{30}O_2$:
%C: 77.71, %H: 10.79.

All analytical operations were as far as possible carried out in an atmosphere of (purified) nitrogen.

Dehydrogenation of the petroleum ether (40/60) soluble oil were attempted with selenium as for the analagous sorbic acid adduct (Part I of this series) Hydrogen selenide was evolved at 310-330°C and after about 60 hours heating at 310°C the reaction was completed.

The product was extracted with the ether solution extracted with aqueous extract, and almost negligible quantity of impure acid was obtained. This was not examined.

The ether solution was dried and the ether distilled off, obtaining, as the non-acidic dehydrogenation product, a dark yellow liquid. Since this product was likely to be a complex mixture, due to the long hydrocarbon chain of the β-elaeostearic acid, no attempt was made to identify it. But, instead, it was oxidised, it being hoped to obtain amongst other possible products, a dicarboxylic diphenyl acid. The following oxidation were attempted:

1. *Neutral aqueous permanganate,* as used for the analagous sorbic acid adduct. As product, only a negligible quantity was obtained on acidifying the final alkaline solution. The acidified, aqueous solution was therefore extracted with ether, yielding, after purification, a small quantity of white short needles.

%C: 71:25%; %H: 5.32%

This solid commenced melting sharply at 79°C, but became entirely liquid only at 140-145°C. The product being a mixture (possibly containing phenylacetic acid, m.p. 79°C) the evidence was inconclusive. A large part of the dehydrogenation product was recovered unreacted from this oxidation, and was used as shown below.

2. *Alkaline permanganate oxidation.*

A temperature of 90°C was required for oxidation to proceed. The yield obtained was negligible.

3. *Acid dichromate oxidation.*

A temperature of 90°C was required, all the product reacting. Again no oxidation product was obtained. It had been hoped to obtain at least a substituted phenyl acid by this procedure.

4. *Oxidation by permanganate in acetone at room temperature.* (interval addition of permanganate over a period of 18 days).

By this method a higher yield was obtained than in the previous oxidations. The product was found to be a mixture of at least two acids, one liquid and the other a solid on boiling in water. Insufficient of the product was obtained for attempting a separation.

Dehydrogenation proceeding with the elimination of hydrogen selenide indicated the presence of a similar adduct to that found in the sorbic acid—styrene reaction. It not having been possible to obtain a single identifiable oxidation product was no doubt due to the complex nature of the dehydrogenation product. This aspect of the investigation was therefore not pursued.

Acknowledgents

The author wishes to express his thanks to the Management of Lewis Berger (Gt. Britain) Ltd., for sponsoring this work (originally published as a thesis under supervision of Professor H. Purton. Brunner, H. and Tucker, D. R. (J. Appld. Chem., *1*, Pt. 12,563,1951) in a publication later than the above, suggested a similar mechanism for the reaction between styrene and tung oil.

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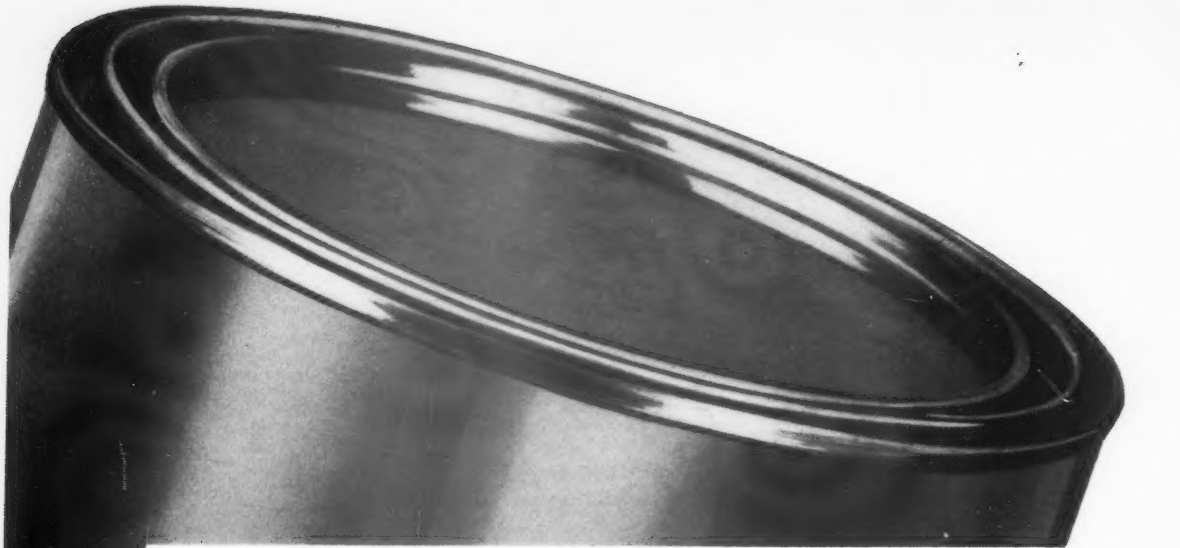

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Vehicle Manufacturers To Hear Talk on Use of Safflower Oil

A talk on "The Use of Safflower Oil in Paint Industries" will be given at a meeting of the Vehicle Manufacturers Group of the New York Paint, Varnish and Lacquer Association scheduled January 13, 6:30 p.m., at the Chemists' Club, New York, N. Y.

J. W. Prane, head of the National Lead Oil and Resin Development Laboratories, Philadelphia, will be the speaker.

He will discuss the utilization of safflower oil in trade sales as well as industrial finishes and will demonstrate some of the properties which can be obtained in finishes by use of this oil.

•

Russell H. Dunham, First Hercules President, Retires from Company

Russell H. Dunham, the first president and former chairman of the board of directors of Hercules Powder Company, Wilmington, Del., has retired from Hercules after 51 years of service with the firm.

Mr. Dunham, who was Hercules' first employee, took office as president in 1912, when the company was incorporated. He continued as president until 1939, and also as chairman of the board until 1944. Mr. Dunham was elected chairman of the finance committee in 1939, a post he held until last year.

Six presidents of firms and organizations in the paint industry are shown at a party in New York held recently by the Martin-Senour Paint Company, during the National Convention of the Retail Paint and Wallpaper Distributors of America. Left to right, are: William M. Stuart, President of Martin-Senour; Roland Morgan, President of the Painting and Decorating Contractors of America, New England Council; Jack W. Zucker, President of the P.D.C.A., New York Council; George Sattler, President of the Anton Sattler, Company, New York, New York; General Joseph F. Battley, President of the National Paint Varnish and Lacquer Association; and Richard Bohl, National President of the P.D.C.A.

Plant Maintenance and Engineering Conference Scheduled Jan. 25-28

A roundtable discussion on the maintenance problems in chemical plants will be included in the program of the Fifth Annual Plant Maintenance & Engineering Conference scheduled January 25-28, at the Hotel Conrad Hilton, Chicago.

Twenty thousand visitors from all parts of the United States and other countries are expected to attend the Conference, which will consist of three general sessions, 16 sectional conferences and 40 roundtables discussions covering all aspects of maintenance in a variety of industries.

Topics include: Maintenance Stores and Storekeeping; Maintenance of Plant Buildings, Corrosion Control and Prevention; Preventive Maintenance —Pros and Cons; Janitor Work—Methods, Techniques Organization and Control.

More than 350 companies will have exhibits at the Plant Maintenance & Engineering Show, which will be held concurrently with the Conference at the International Amphitheatre in Chicago.

Advance Solvents Holds Latest Paint Clinic in Baltimore, Md.

A paint clinic, latest in a series being conducted by Advance Solvents & Chemical Corporation, New York, N.Y., was held December 2, at the Friendship Airport Administration Building in Baltimore, Md.

More than 40 representatives of the protective coatings industry in the Baltimore-Washington, D. C. area attended the meeting.

Personnel of Advance Solvents who spoke included:

Advance Zirco Drier Catalyst 6 Per-Cent, George Gregg.

Advance Paint Specialties, Charles Gardner.

Advance Stabilizers, Dr. Emery Parker.

The vie vs below show a few of those who attended. Among them were Arthur B. Mullaly, president, and Jesse Young, George Gregg, Dr. Emery Parker and Charles Gardner.

NEWS DIGEST

Pennsylvania Industrial Chemical Corporation Merges with Pa. Firm

The Pennsylvania Industrial Chemical Corporation and the Pennsylvania Falk Chemical Company have merged, and will continue operation under the name Pennsylvania Industrial Chemical Corporation.


L. Reizenstein

Louis J. Reizenstein, President of Pennsylvania Falk, was elected a director of the new corporation. He will serve in an executive sales capacity.

R. W. Ostermayer, President; F. W. Corkery, Vice President of Sales, and other officers of Pennsylvania Industrial Chemical will continue in their former positions in the newly formed firm.

Pennsylvania Industrial has opened new offices in the News Building, 220 East 42nd St., New York, N. Y., and 600 South Michigan Ave., Chicago.

Cabot Pigment Div. Appoints Wollastonite Rep. in California

The White Pigments Division of Godfrey L. Cabot, Inc., Boston, Mass., has appointed the B. F. Wagner & Co., Pasadena, Calif., as representative for sale of wollastonite to the ceramics industry in California.

The wollastonite deposit owned by Cabot is located at Willsboro, New York, and is the only known one of commercial importance. Reserves are estimated to be adequate for 250 years of supply.

•

C.S.M.A. President Predicts Peak Year for Chemical Mfrs.

1954 will be one of the most promising years in the history of the chemical specialties industry predicted Melvin Fuld, newly elected president of the Chemical Specialties Manufacturers' Association at the C.S.M.A.'s 40th Annual Meeting held December 7-8, at the Mayflower Hotel, Washington, D. C.

Mr. Fuld, president of Fuld Brothers, Inc., Baltimore, Md., told the gathering of chemical industry representatives that an unprecedented volume of new products was coming on the market in 1954, and that because the public had been conditioned to expect new scientific developments proper sales promotion would raise sales to a new peak.

Canco Closing Machine Supervisor Retires After 45 Years with Firm

S. S. Jacobs, design supervisor of American Can Company's closing machine department, retired recently after 45 years of service with the firm.

Mr. Jacobs intends to establish a consulting service on the Pacific Coast for the development, design and production of food and packaging machinery.

Well known throughout the packaging design field, Mr. Jacobs has contributed to the development of various types of can manufacturing and can closing equipment. He started as a draftsman with Canco in 1908, and became chief designer of the firm's San Francisco machine shop in 1925. He transferred to New York in 1945 as assistant to the manager of the equipment division and in 1950 became design supervisor of the closing machine department.

•

Cuno Engineering Names Jameson Company its St. Louis Sales Rep.

The Cuno Engineering Corporation, Meriden, Conn., has appointed the Jameson Company, St. Louis, Mo., as its industrial sales representatives for the St. Louis territory.

The territory includes Southern Illinois, all but a portion of Western Missouri and small areas of Eastern Kentucky and Tennessee.

Glidden Completes Modernization Of Its Atlanta, Georgia Paint Plant

The Glidden Company, Cleveland, has announced it has completed modernizing its Atlanta, Ga., paint plant. The plant, the firm's 10th in this country, was purchased a year ago.

New facilities added by Glidden include a new office building and three stock warehouses, as well as the research laboratory and production equipment. The new offices are completely air-conditioned and the production operations incorporate the latest principles in materials handling, a Glidden release said.

James L. Beauchamp, Southern regional director for Glidden, is manager of the new plant. Assisting him are: Walter S. Herner, plant superintendent; Harold W. Hayward, director of laboratory research and production control, and James F. Lanier, sales manager.

The Atlanta plant at present is servicing 11 branches and warehouses in the southeast. They are located at Birmingham, Ala.; Chattanooga, Tenn.; Knoxville, Tenn.; Mobile, Ala.; Nashville, Tenn.; Miami, Fla.; Jacksonville, Fla.; Orlando, Fla.; Tampa, Fla.; Charlotte, N. C., and Atlanta.

Left photo: Conveyorized labeling and packing equipment in the Glidden Company's Atlanta, paint plant. Paint products in huge thinning or mixing tanks shown at right flow under their own weight from two upper levels, not shown. From the tanks, gravity flow carries paint through automatic straining and filling processes to labeling equipment. Right photo: Section of plant's new lab.

NEWS DIGEST

CONVENTION ANNOUNCEMENT

In 1955 the annual conventions of the National Paint, Varnish and Lacquer Association, Inc., and the Federation of Paint and Varnish Production Clubs will be held separately, it was announced recently by Joseph F. Battley, President of the N.P.V.L.A., and Calvin J. Overmeyer, President of the F.P.V.P.C., in a joint letter.

This change does not affect the 1954 convention which will be held on successive days during the same week as heretofore. Information regarding the joint 1954 convention will be sent to all members of both organizations in due course, the letter said.

The move for a separate convention was initiated by Federation officials who felt that their expanding organization will be best served by regional meetings and an earlier annual meeting than has been the case in past years.

The officials also felt that this action will permit greater flexibility in selecting annual meeting cities and hotels by both the National Paint, Varnish and Lacquer Association and the Federation of Paint and Varnish Production Clubs. Other factors considered by the Federation were:

(1) Better hotel accommodations will be available for members of both organizations and for exhibitors.

(2) Executive and technical personnel will not be absent from their business simultaneously.

(3) Federation convention can be extended to three or four full days.

•

Ferro Installs Smelters at its Cleveland and Nashville Plants

Eight new continuous roll-quench smelters have been installed by the Ferro Corporation, Cleveland, in their Cleveland and Nashville, Tenn., plants.

The smelters, installed at a cost of $375,000, are used by Ferro in the production of porcelain enamel frit needed to coat kitchen appliances, sanitary ware and building material with a permanent finish.

Ferro has also completed a $100,000 addition to its Cleveland warehouse, as well as an extension to its Research and Development Laboratory there at a cost of $140,000.

Distributor luncheon held at recent Paint Industry Show by Edgar Brothers.

Edgar Brothers Holds Distributor Luncheon at Paint Industry Show

A Distributor Luncheon was held by Edgar Brothers Company at the recent 1953 Paint Show in Atlantic City, N. J.

Among the speakers at the Luncheon meeting, conducted by Robert V. Dilley, Edgar Bros. Manager of Specialty Sales, were: Dr. C. G. Albert, Director of Research, who discussed new Egar products in general; Peyton Wheeler of the Research Department, who highlighted new product developments pertaining to the Paint Industry, and A. G. Blake, Vice President, who outlined the firm's 1954 Sales and Advertising Program.

Gene Hempel of Edgar Brothers Specialty Sales, gave the meeting's final talk on the place and potential of inerts in the manufacture and processing of paints and plastics.

National Starch Vice President Returns from European Trip

A. A. Halden, Executive Vice President of National Starch Products, Inc., New York, N. Y., has just returned from an extensive European trip where he visited the firm's plants in England and Holland.

He also travelled through France, Germany and Italy, discussing with producers of chemicals and various natural raw materials regarding the supply and market expectations for 1954.

Mr. Halden said it was reassuring to see the great progress made throughout Europe in rebuilding and modernizing.

Symposium on Color of Transparent Media Scheduled February 3, 1954

A Symposium on Color of Transparent Media will be among the features of the 1954 Committee Week of the American Society for Testing Materials scheduled February 1-5, at the Shoreham Hotel, Washington, D. C.

The Symposium, sponsored by the A.S.T.M. Committee E-12 on Appearance, will be held in two sessions, morning and afternoon, on Wednesday, February 3.

Four paper will comprise the morning session: Color in Petroleum Products; A Color Space for Color Grading Purposes; Color Problems in Glass Products, and Color in the Brewing Industry.

The three papers to be presented during the afternoon session will include: Color Problems in Sugar Clarifinate; Color Grading of Agricultural Products, and Color Problems in Transparent Surface Coatings.

Among the 40 main technical committees and their subcommittees scheduled to meet during Committee Week is Committee D-1 on Paint, Varnish, Lacquer, and Related Products.

•

A. J. Wittenberg Co. Constructs Synthetic Resins Facilities in Ga.

The A. J. Wittenberg Company, subsidiary of the U. S. Industrial Chemicals Co., has announced the completion of manufacturing facilities at Valdosta, Ga., for the production of a wide range of synthetic resins.

Presently the plant produces a full line of quality phenolic, maleic modified resins, easter gums and many specialty resins for individual industry requirements. Pure phenolic resins thermosetting and thermo plastic, as well as a range of polyterpene and terpene phenolics are scheduled for early production.

The new plant is located adjacent to the Gum Processing plant of the Glidden Company's Naval Stores Division.

NEWS DIGEST

The American Chemical Paint Company's Detroit office, which handles its Mid-West territory has moved to 10225 West McNichols Road, Detroit 21, Mich. D. L. Miles is Manager.

Specialized Coatings Course To Be Offered by Newark College of Eng.

A new paint technology course in Specialized Coatings will be offe ed by the Newark College of Engineering, Newark, N. J., from February 2 to April 20, 1954.

The course, which will cover architectural, industrial, marine and corrosion-resistant finishes, will be presented in cooperation with the educational committees of the New York Paint, Varnish and Lacquer Association and the New York Paint and Varnish Production Club.

A course in Basic Coatings will be given concurrently with the new course, along with the 12th annual presentation of two conferences in "The Technology of Paint Varnish and Lacquer," and "The Chemistry of Synthetic Resins and High Polymers."

Course instructors will be Edward E. Raswyck, Reichhold Chemicals Inc.; Bernard J. Godfrey, E. I. DuPont de Nemours & Company, Inc.; Robert Ringen, Paul O. Abbe Inc.; and George C. Hull, Anglo-American Varnish Co;

Also, Silas Mountsier, Wittaker, Clark & Daniels, Inc.; Roy Brown, Egyptian Lacquer; Kenneth U. McCullough and Stanley H. Richardson, Bakelite Corp.; Austin Allen, Vita-Var Corp.; and Emanuel H. De Nio, Sapolin Paints, Inc.

Conference speakers will be Dr. Calvin A. Knauss, Reichhold Chemicals Inc.; Edwin Gallagher, National Lead Co.; Gerry P. Mack, Advanced Solvents & Chemical Corp.; Professor Frederick W. Bauder, Newark College of Engineering; Louis A. Melsheimer, American Cyanamid Co.; Dr. Lyde S. Pratt, Calco Chemical Co.; and Jack Greenfield, U. S. Industrial Chemical Co.;

Also, Harold Shakespeare, Titanine Corp.; James Shelley, Rohm and Haas Co.; R. A. Calsibet, Bakelite Co.; George S. Cook, General Electric Co.; Dr. J. D. D'Ianni, Goodyear Tire and Rubber Co.; Robert Terrill, Spencer Kellogg and Sons, Inc.; and Clarence V. Wittenwyler, Shell Chemical Corp.

The session will include an inspection trip to the U. S. Industrial Chemical plant.

•

Sharples Chemicals Moves to New Executive Offices in Phila.

Sharples Chemicals, Inc., Philadelphia, moved to new executive offices at 1100 Widner Building, Philadelphia, on December 21.

F. J. Kennerley, Hercules Powder Treasurer, Retires from Company

Francis J. Kennerley, Treasurer and member of the Board of Directors and Finance Committee of the Hercules Powder Company, Wilmington, Del., retired from the firm January 1, 1954, after 44 years' service.

Mr. Kennerley was presented with a lounging chair by his associates when he announced his retirement plans recently.

The treasurer of Hercules since 1943, Mr. Kennerley became a director of the company in 1947, and was elected a member of the finance committee in 1949.

He joined Hercules in 1913.

•

Dow Chemical Vinyltoluene Plant At Midland, Mich., in Production

The Dow Chemical Company's vinyltoluene plant at Midland, Mich., is now in full production.

At present one of the most important use of vinyltoluene has been in the paint industry where the chemical has been used to form paint vehicles.

Dow's Midland plant is composed of alkylation, cracking and finishing units, with a tank storage farm located adjacent to these facilities.

Fatty Acid Research Fellowship Established by Soap Association

A fellowship for research on fatty acids derived from domestic fats and oils has been established in the U. S. Department of Agriculture by the Association of American Soap and Glycerine Producers, New York, N. Y.

This project will be part of the Department's research program aimed at finding new uses and wider markets for fats and oils.

The study will be directed particularly to research aimed at broadening the industrial application of fatty acids, which comprise 90 per cent of the weight of our domestic fats and oils.

The fellowship which provides for a Senior and Junior Fellow, extends for one year and may be renewed by mutual agreement. The Agricultural Research Service's Eastern Regional Research Laboratory in Philadelphia, will supervise the research.

In announcing the project, the Department pointed out that increased production and lower consumption of fats and oils in the United States in recent years has caused mounting surpluses of these products. The problem is especially acute for animal fats. Surplus animal fats amounted to about 700 million pounds in 1952.

The fellowship project will augment substantially the research on fats and oils at the Eastern Laboratory, particularly as it applies to fatty acids and possible modifications or derivatives of fatty acids.

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Shell Chemical To Construct Allyl Chloride and Chlorohydrins Plant

An allyl chloride and chlorohydrins plant will be constructed by the Shell Chemical Corporation at Norco, La.

The plant, when completed late in 1954, will increase Shell Chemical's glycerin production by 25 million pounds and make available substantial additional quantities of epichlorohydrin and Epon resins.

NEWS DIGEST

Production Club News

The Technical Committee of the New York Paint and Varnish Production Club held its monthly meeting on December 10, at the Brass Rail Restaurant in New York City.

A committee was formed, with Robert J. Phair of Bell Laboratories as chairman, to contact the Federation to clarify the work desired in their contemplated study of thickness gauges for field testing.

S. Leonard Davidson of the National Lead Company, offered some production problems for possible investigation by the Technical Committee:

The simplification and standardization of color standards, light sources and procedures for matching colors.

Study of more efficient straining and clarification of finished goods;

Study of more efficient filling of containers;

Production planning and scheduling for both small and large plants.

A committee was formed, with Mr. Davidson as chairman, to study the first problem, i.e., Color matching standards and procedures.

Harold Parks suggested that a study be made to secure complete opacity data for all pigments through the complete practical range of Pigment Volume Concentrations. Considering the extensive nature of the work involved, Mr. Parks was appointed chairman of a committee to set up a narrower phase of the problem for presentation to the Committee.

George S. Cook of General Electric Co., presented two suggestions for consideration:

To prepare a one volume compilation of all Production Club papers.

To set up a committee to review the literature and select a few papers each year to be discussed at Technical Committee meetings. The authors of chosen papers would be invited to enter the discussions.

E. G. Shur of Interchemical Corp., discussed the work being done by his sub-Committee studying "Solvents." The Committee has standardized on a new device for measuring evaporation rate, and will check Toluene as a typical pure solvent and Mineral Spirits as a typical mixed solvent.

The next meeting of the Technical Committee will be held January 21, at 6:30 p.m., in the Brass Rail.

Northwestern

The monthly meeting was held December 11, at the Town & Country Club, St. Paul, Minn.

Ed. Erickson announced that Elmer Stark has won this years' Ernest T. Trigg award. Mr. Stark was presented with a $25 check.

Speaker of the evening was I. C. Clare of the C. K. Williams Company, who discussed, "Recent Developments in Iron Oxide Pigments."

He first discussed the colors that occur in natural oxides, namely yellows, browns, reds, and blacks. Mr. Clare reviewed the processes involved in providing a synthetic oxide for each natural oxide color. Referring to the peculiarities of color in different vehicles at different pigment volumes, Mr. Clare showed through the use of slides that control of uniformity can be achieved with a synthetic oxide.

Mr. Clare then spoke of a new process known as VVF (meaning very very fine). This process reduces part-size from 30 microns and over to 15 microns and under. He demonstrated with slides and painted panels that iron oxides pigment given the VVF treatment have better color, more opacity, higher gloss at higher loading and are finer and smoother in texture. In addition, the use of small percentages of organic toners are not recommended for exterior exposurers they become very fugitive. They can, however, be considered for interior use.

Detroit

Following the dinner at the November 17 meeting, Don Newell, ad chairman of the Standards and Methods of Test Committee, received a check for 25 dollars representing the Heckel Award.

Mr. Newell received the award for his paper, delivered at the National Convention in Atlantic City, on evaluating instruments for measuring the degree of gloss of automotive finishes. The Committee's work has led to a series of vinyl panels in progressive degrees of gloss to be used as an easily portable and inexpensive device for field testing of automotive finishes.

The December 22 meeting featured a talk by F. S. Greenwald, Chief of the Protective Coating Industry, on "Rare Metal Soaps and the Paint Industry."

The meeting was conduced by the Nuodex Products Company.

Philadelphia

The November meeting was held at the Engineers Club.

Officers for the coming year were installed. They are: President, P. J. Whiteway; Vice-President, F. M. McNerney; Secretary, J. A. Davis; Treasurer, E. G. Fleming; Executive committee, R. Toothill and J. P. Snyder.

Harry Howard of the Shell Corp., discussed "Amine Cured Epon Resin Systems." This covered a short resume of previous work, Methods of curing Epon Resins, Study of package stability of pre-mixed systems, Solvents, and commercial resins used in the system, and Recommended spraying methods.

The December meeting was also held at the Engineer's Club.

Franklin King, Jr. of Godfrey L. Caobt, Inc., was speaker of the evening.

He discussed Wollastonite, giving graphic comparison of two grades with talc and calcium carbonate.

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San Francisco Company Appointed Schenectady Resins' W. Coast Rep.

Schenectady Resins, Division of the Schenectady Varnish Company, Inc., Schenectady, N. Y., has appointed R. E. Flatow & Co., 244 California St., San Francisco, Calif., as West Coast representative.

The Baker Castor Oil Co. held its Annual Sales Meeting recently at the Commodore Hotel, New York, N. Y. Top row, left to right are: John W. Hayes, Marvin C. Rasmussen, J. C. Kay, E. M. Sterling, C. R. Swenson, R. L. Vignolo, L. Jubanowsky and J. F. O'Brien. Bottom row: B. H. Cogswell, John Ottens, R. E. Rulison, H. H. Fritts and J. G. Phillips.

20th Century Paint & Varnish Corp. Holds 1953 Sales Meeting

The 20th Century Paint & Varnish Corporation held its 1953 Sales Meeting during the Retail Paint & Wallpaper Dealers Convention at the Hotel Statler, New York, N. Y.

David S. Lifson, President of 20th Century, spoke on the company's overall policies for the coming year and reviewed activities for the past year.

The firm's Chief Chemist, Benjamin Chatzinoff, discussed latest advances.

Theodore M. Friedmann, Sales Manager, then presented the company's plans for a Spring Promotion and forthcoming sales policies.

In attendance were: Nathan Hillman, Arthur Hemmerdinger, Sid Rappaport, M. R. Reno, Lawrence Mayer, Richard Jennings, Sol Marburger, Benjamin Weinstein, Wallace Blackburn, Jere Lifson, Michael Lifson, Peter Matienzo and Dan Vogel.

Industry Must Replace Obsolete Machinery, Executive Asserts

One of the most important problems facing industry is the replacement of obsolete machinery and production equipment to meet-growing competition, according to S. D. Maddock, president of the C.I.T. Corporation.

Mr. Maddock said a survey conducted by the American Society of Tool Engineers showed that 28 per cent of industry's production equipment and manufacturing processes are inadequate or obsolete.

"It is obvious," he asserted, "that thousands of company's are losing much of their potential income because equipment which has outlived its usefulness is nibbling away profits with slow production and excessive maintenance costs. Manufacturers must use modern machinery if they are to stay competitive."

New York Pigment Club To Elect Officers at January 15 Meeting

The New York Pigment Club will elect officers for the new year at its first annual meeting scheduled January 15, at 6:30 p.m., in the Fraunces Tavern, New York City.

The following slate has been nominated: President, Aaron Permut; Vice-President, R. J. O'Brien; Secretary, E. A. Wich, and Treasurer, Hans A. Kahn.

For board of governors the following have been nominated: Herbert Johnson, C. H. Love, J. B. Arnold, John Shown, John Donahue and Casper Smith.

E. A. Pice of the International Nickel Company, will speak and present a sound film on, "Corrosion Resistance of Nickel Alloys."

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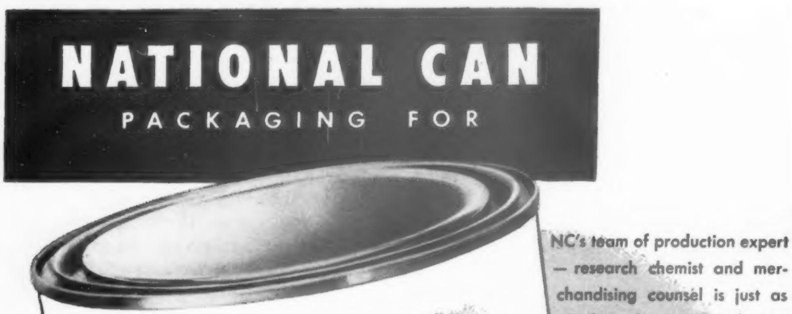


P. H. Cathcart

R. C. Alexander

E. M. Deane

Paul H. Cathcart, Jones-Dabney Sales Representative, Retires

Paul H. Cathcart, associated with the sales department of the Jones-Dabney Company's Resins and Chemicals Division for 17 years, has retired from the firm.

A veteran of 40 years in the paint industry, he began his career with the Bureau of Standards Laboratories. Mr. Cathcart was associated with several paint firms, including one he owned, before joining Jones-Dabney in 1937.

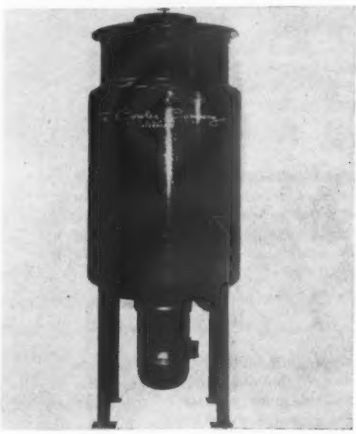
R. C. Alexander has been appointed to take over Mr. Cathcart's position as sales representative in the Midwest area, which covers most of Chicago, other points in Illinois, and Kansas City, Mo.

Simultaneously announced, was the appointment of E. M. Deane to cover the Detroit, Mich., area and other points in Michigan and northern Indiana.

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new and improved products. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



COWELS

DISSOLVER
With Bottom Drive

"Bottom Drive" model of the Ultrafast Dissolver has been found successful in speeding up dissolving, dispersing and mixing operations by as much as 32 times, according to the manufacturer.

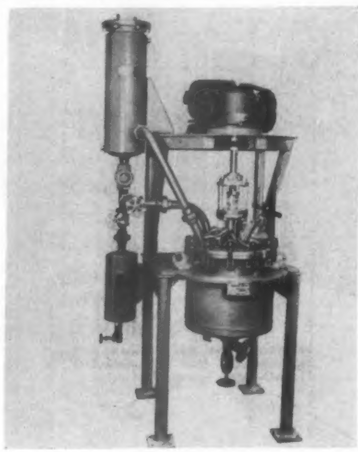
The new bottom drive machine, a specialized adaptation of the standard dissolver, is equipped with the motor mounted beneath the unit. The shaft driving the patented impeller enters from the bottom of the tank. This eliminates aeration of materials during processing and permits easy pressurizing of the tank. For more details on this unit, write to Cowles Company, Inc., Cayuga, N. Y.

COLOR BLACKS
Two Grades

Elf 75 and Elf 75 Densed are two non-premium inks and color grades of channel black.

Elf 75 is a fluffy black which is claimed to offer longer flow properties than ordinary grades of channel black, yet equal jetness, at regular channel black prices. The extra volatile content of Elf 75 gives increased flow and greater flexibility in formulations.

Elf 75 Densed is neither a fluffy nor pelletized form of black. It has the same analyticals as Elf 75 except for density. The increased density of this particular type results in substantial shipping cost savings and requires about one-third less storage space, according to the manufacturer. Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass.



BRIGHTON

PILOT KETTLES
For Phenolic Resins

Stainless steel lab kettle, model C-10, is specially designed for synthesis of phenolic resins; may be used in other applications. Equipped with anchor-type agitator with variable speed drive, condenser and receiver, and condensing arrangement for either refluxing or withdrawing. The steam jacket, for pressures to 150 psi, has a continuous spiral baffle to insure maximum cooling efficiency when water is circulated. Unit is made to ASME code, inspected and stamped for internal pressures up to 25psi or vacuum. Production sizes can be built up to 3000 gallon capacity. Brighton Copper Works, Inc., 820 State St., Cincinnati 4, Ohio.

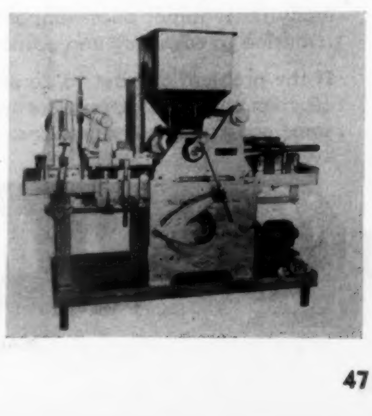
BODYING AGENT
With Other Uses

"Thixcin" is a fine powder developed specifically for imparting bodying and puffing action to pigmented vehicles. It is generally used at levels from 4 to 6 lbs. per 100 gallons of finished paint. It is claimed that at such levels, this material exerts a bodying and puffing action which is retained during shelf-storage. It no way detracts from the dry, hardness, or water resistance of the final paint film. The manufacturer also recommends that this material may be used as an anti-sagging agent in paints and as a beneficial additive to calks. The Baker Castor Oil Co., 120 Broadway, New York 5, N. Y.

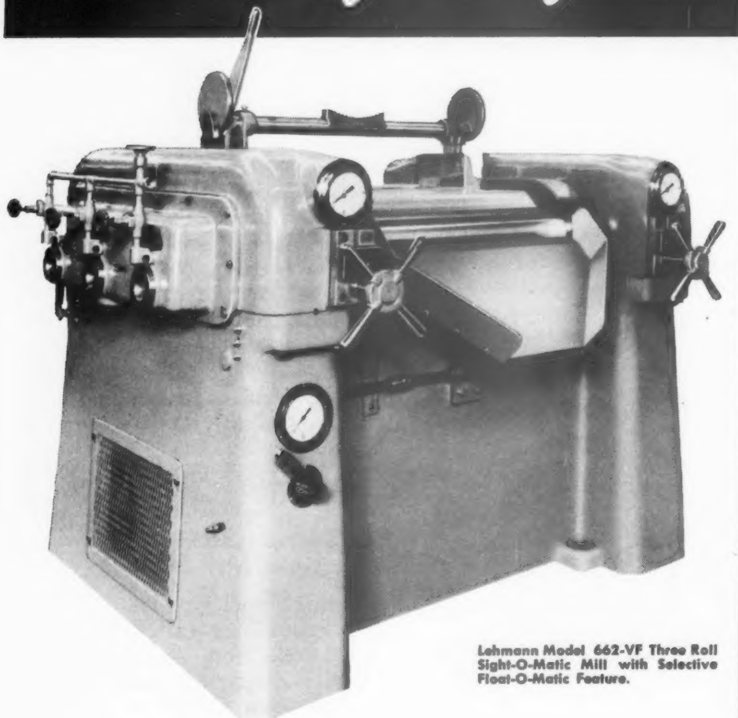
FILLING MACHINE
Fully Automatic

Filling machine fills ½ pint, pint, quart, and gallon cans with paint, oil, and similar viscous products, then dispenses lids and presses them firmly in place on the containers. Containers move only a minimum amount as they do not have to be raised or lowered for the filling, capping and pressing operation. Manufacturer claims that production on this combination unit is from 20 to 50 cans per minute. Hopper capacity is 33 gallons. The Filler Machine Co., Inc., Philmont Club Station, Pa.

FILLER



One thing after another keeps LEHMANN PAINT MILLS *ahead of the field—*



Lehmann Model 662-VF Three Roll Sight-O-Matic Mill with Selective Float-O-Matic Feature.

Sight-O-Matic Control— four gauges, one at each end of slow and fast rolls, enable operator to see exact changes in roll pressures as he adjusts them. Insures fast, accurate, positive setting of roll pressures to accommodate requirements of any formulation.

Pneumatic Discharge Control— take-off knife pressure constantly maintained by continuous air pressure to knife blade through pressure regulating valve. Indicating gauge in air line shows amount of knife pressure.

Roll Temperature Control— dial thermometers at each of roll water outlets and at water inlet manifold guide control of discharge water temperature from each roll.

Float-O-Matic Feature— permits choice of "floating" or fixed center-roll operation. Simple adjustment converts from one to the other quickly. Offers operator option of four-point or two-point adjustment, whichever is the more practicable for handling a given formulation.

Centrifugally Cast Dual Metal Rolls— centrifugal casting technique provides tighter, denser grain structure. Intensely hard chilled white iron surface inseparably bonded to gray iron core.

Centralized Lubrication— lubrication headers are concentrated on the discharge side of Lehmann Roller Mills. This makes grease gun lubrication of all bearings easy and convenient.

Adjustable Motor Base— a hinged motor base makes it easy to adjust belt tension, assuring efficient power transmission and quiet operation.

A manufacturer can't help learning a thing or two if he has been in business for 120 years, as we have. Take roller mills, for instance. Although we have been designing and making them for many decades for the paint, ink, soap and chocolate industries, we are always learning something new about them. And those new ideas tend constantly toward lower operating costs for the user of LEHMANN ROLLER MILLS.

In the panel are listed a number of roller mill improvements developed by Lehmann over the years. There were also many other minor ones—important in their aggregate contribution to efficiency and economy.

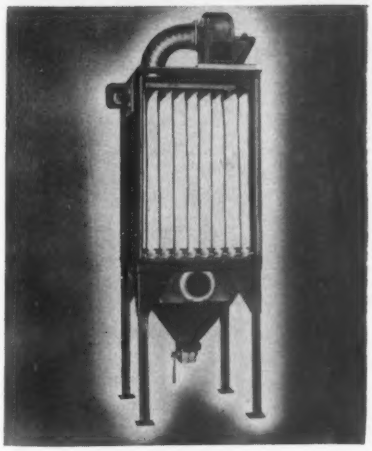
If the problem of what to do about manufacturing costs is on your mind today, send for us. We may be able to make some constructive suggestions.

LEHMANN

J. M. LEHMANN COMPANY, Inc.

MAIN OFFICE AND FACTORY: 558 NEW YORK AVE., LYNDHURST, N. J.

N E W
MATERIALS — EQUIPMENT



PANGBORN

DUST COLLECTOR
Cloth Bag Type

Cloth bag type collector is designed for economical and efficient dust collection for smaller applications. Each unit is self contained and shipped assembled ready for installation.

Collector is designed for indoor use and cleaned air can be discharged inside the plant. Finely divided dusts such as carbon black, pigments, metal oxides, etc. are collected through filter bags.

Seven sizes of the CN collector are available, ranging from 200 to 1000 sq ft. of cloth area. Sizes 200 to 500, inclusive, have one hopper and nine bags. Width and depth are constant, additional capacity being supplied by lengthening the bag. Sizes 600, 800 and 1000 are double sections of the 300, 400 and 500 sizes, featuring two hoppers and 18 bags, but only one air inlet and one settling chamber.

Complete installation data can be obtained from the Pangborn Corporation, Hagerstown, Md.

COBALT HYDRATE
For Cobalt Compounds

Cobalt hydrate is recommended for use in the manufacture of cobalt paint driers, and as an additive for lithographic printing inks. For complete details on this material, write to Witco Chemical Co., 260 Madison Ave., New York 16, N. Y. and request a copy of Technical Service Report P-19.

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: HOW TO MAKE PAINT STICK TO GALVANIZED IRON WITH LITHOFORM®

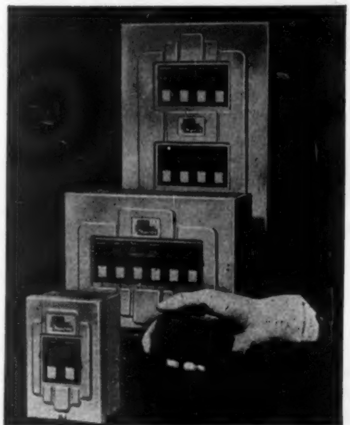
INTRODUCTION

"Lithoform" forms a dense, zinc phosphate coating on zinc, cadmium, and galvanized surfaces—including Galvanneal, cadmium plated steel, zinc plated steel, zinc base alloys, and zinc base die castings. The "Lithoform" coating, which is non-metallic and inactive, retards reaction between alkaline metal oxide and the paint film. Peeling and loss of adhesion are thus greatly retarded on painted Lithorized zinc and cadmium.

ADVANTAGES OF "LITHOFORM"

"Lithoform" forms a durable bond for paint. It is economical. It eliminates frequent repainting. It protects both the paint finish and the metal underneath. "Lithoform" meets these Government Finish Specifications:

QQ-P-416
RR-C-82
MIL-E-917A (Ships)
JAN-F-495
AN-F-20
U.S.N. Appendix 6



Photograph by courtesy of Murray Manufacturing Corp.
Murray Circuit Protectors are fully magnetic and provide maximum protection for both domestic and industrial wiring. Housings are of galvanized iron which is Spray Lithorized for long paint life.

THE LITHORIZING PROCESS

"Lithoform" can be applied by brushing or spraying the work with simple hand equipment, by dipping it in tanks, or by spraying it in industrial power washers.

Brush. Galvanized bay windows, cornices, rain gutters, hardware, building siding, truck panels, and farm equipment are typical of the many surfaces that are treated effectively with Brush "Lithoform".

Dip. This grade is used for coating cleaned surfaces of such typical products as cabinets, refrigeration condensers, etc., immersed in heated solutions in tanks.

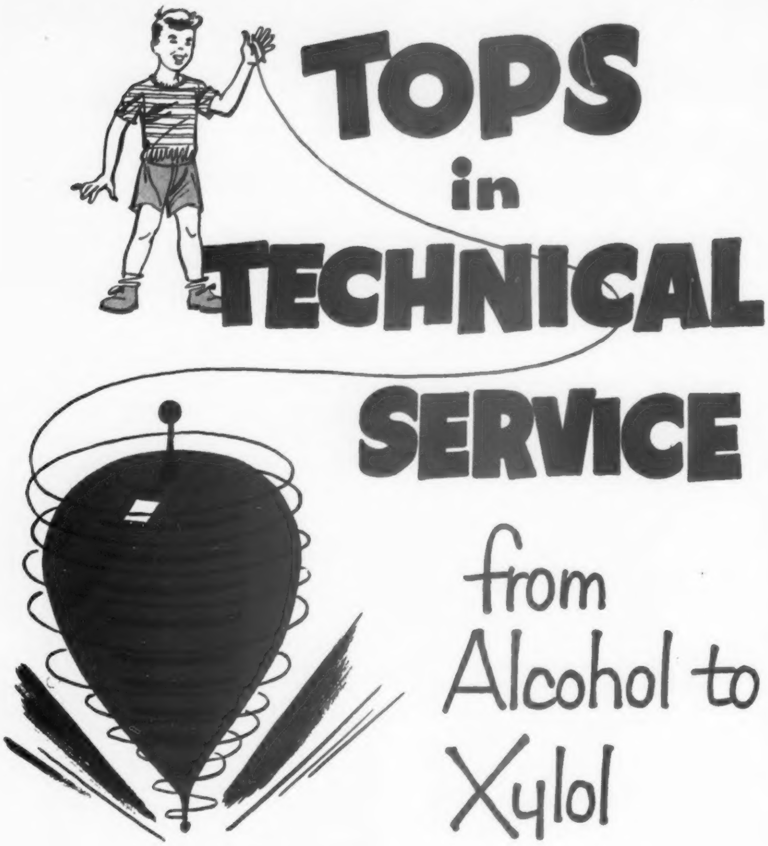
Spray. The spray process is the most logical one with which to coat sheets, coiled strip or duplicate products best processed on a conveyor.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "LITHOFORM" AND ON YOUR OWN METAL PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

THE SOLVENTS AND CHEMICALS GROUP



Aliphatic Petroleum Naphthas
Alcohols and Acetates
Aromatic Solvents, Petroleum and Coal Tar
Chlorinated Solvents
Glycols and Amines
Ketones and Ethers
Naval Stores
Oils and Fatty Acids
Plasticizers
Stearates
Waxes

WANT quick, helpful suggestions for the solution of technical problems involving solvents and chemicals? Call your nearby member of the Solvents and Chemicals Group. Here's why . . .

1. Each member maintains laboratory facilities to help serve industry as well as control quality and purity of incoming products.
2. Each group member has technically trained men familiar with problems in the industries they serve.
3. Each member is free to call on the technical departments of its nationally-known principals. Members welcome an opportunity to provide assistance on any bona-fide problem in the areas in which they serve.

Unbiased technical service is just one more reason for choosing Solvents and Chemicals Group members as your source of supply. Investigate this modern, time-saving, money-saving service that supplies *what* you want . . . *when* you want it . . . *where* you need it . . . all with just *one phone call*! Call your nearby Group member or write . . .

THE SOLVENTS AND CHEMICALS GROUP

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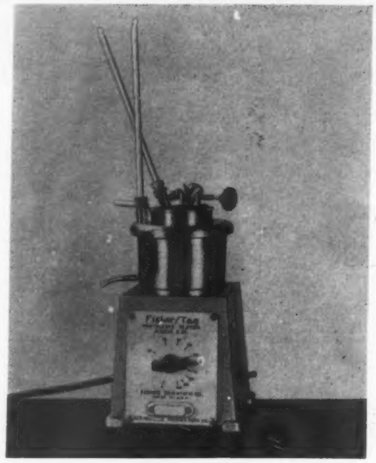
BUFFALO, Bedford 1572
CHICAGO, SEeley 3-0505
CINCINNATI, MElrose 1910
CLEVELAND, CLearwater 1-3770
DETROIT, WAlnut 1-6350
FORT WAYNE, ANthony 0213
GRAND RAPIDS, Grand Rapids 5-9111
HOUSTON, Orchard 6683
INDIANAPOLIS, ATlantic 1361
LOUISVILLE, Wabash 3393
MILWAUKEE, GReenfield 6-2630
NEW ORLEANS, Temple 4666
ST. LOUIS, GArfield 3495
TOLEDO, Jordan 0761
WINDSOR, Ontario 4-4378

NEW MATERIALS — EQUIPMENT



FISHER

FLASH POINT TESTER

Electric-Type Available

Fisher/Tag Closed-Cup Flash-Point Tester is a basic re-design of the TAG tester that was originally made for the petroleum industry, and was adopted by the paint and industrial-solvents people as well. Used wherever information is desired on the flash point of mobile liquids, except fuel oils, in closed containers below 175 deg. F.

This unit is said to meet specifications of ASTM D-56; ASA Z-11.24; Federal Specifications 110.0; API Standard 509, and has been adopted by the various paint organizations. Available as an electrically-heated instrument. A 150-watt heater, and variable-power transformer with reproducible setting, supply the close control necessary for the low heating rate required by the ASTM D-56 test. Other models available—gas and alcohol. Fisher Scientific Co., 717 Forbes St., Pittsburgh, Pa.

WETTING AGENT

For Dispersions and Emulsions

Wetting agent, "Monawet MO", is the sodium salt of di-(2-ethylhexyl)- sulfosuccinic acid. According to the manufacturer, this product has proved its usefulness, wherever penetration, wetting out or depression of surface tension are required. This wetting agent is said to be stable indefinitely in neutral, cold, or hot water solu-

tions; stability is claimed to be very good in solutions within a pH range from 5 to 9. In acid solutions below a pH of 5, the break-down is accelerated but this wetting agent may be well suited for use in many acidic media. Based on the ester character of the product, hydrolysis increases rather rapidly in alkaline solutions with a pH above 9, leading to total destruction of the wetting agent at a pH of 12. Available in liquid, paste, and gel forms. Mona Industries, Inc., 65-75 E. 23rd St., Paterson 4, N. J.

STYRENATED ALKYD
Fast Drying

Cycopol 320-5, styrenated alkyd copolymers, is said to have the following properties: improved resistance to aliphatic hydrocarbons, good adhesion, hardness, and chemical resistance, and fast drying characteristics. The producers of this particular resin claim that exposure tests have shown outstanding gloss retention and resistance to chalking and bronzing, especially during the important early months of exposure. Suggested uses include automotive finishes, industrial enamels, pump enamels, floor finishes, railway finishes, machinery enamels, toy enamels and implement enamels. For complete details regarding formulation, application properties, compatibility, etc., write to American Cyanamid Co., Coating Resins Dept., 30 Rockefeller Plaza, New York 20, N. Y.

HYDROCARBON RESIN
Heat Reactive Type

Neville LX-782 is an oxidizing, heat reactive resin of the hydrocarbon type that does not darken on exposure to ultra-violet light, according to the manufacturer. It is a neutral, unsaponifiable resin which exhibits resistance to acids, alcohols, alkalis, and water. Vehicles may be prepared by cooking this hydrocarbon resin with drying oils at a minimum of 550 deg. F. for 30 to 45 minutes. For further information on this particular resin, write to the Neville Chemical Co., Pittsburgh, Pa.

WILLIAMS
announces new line of
natural iron oxide
pigments

very very fine
VVF

VVF pigments are produced by our unique grinding process to give a very, very, fine product controlled for top particle size and particle size distribution.

VVF pigments will reduce your grinding and dispersing time in paints and allied products as much as 75%.

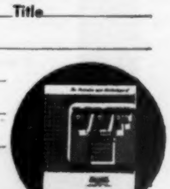
VVF pigments give you brighter mass color, stronger tint, increased hiding power, and higher gloss than standard grind pigments.

VVF pigments now available are—Raw and Burnt Siennas, Raw and Burnt Umbers, Metallic Browns, Red Iron Oxide, and Primer Pigments.

Your Williams representatives will gladly give you complete information on this new pigment group—or mail coupon for illustrated VVF TECH REPORT.

WILLIAMS
COLORS & PIGMENTS
"OUR 75th YEAR"
C. K. Williams & Co.
Easton, Pa.
East St. Louis, Ill.
Emeryville, Cal.

MAIL COUPON TODAY
C. K. WILLIAMS & CO., Easton, Pa., Dept. 23
Please send me VVF TECH REPORT giving physical and chemical specifications and list of suggested applications.
Name ____ Title ____
Company ____
Address ____



Personnel Changes

INDUSTRIAL-MARINE

John Burry, Jr., a chemist, has been named to the firm's technical sales department. Industrial-Marine Products, Inc. is a division of the Burry Corporation.

KYANIZE PAINTS

J. VanVloten has been named general sales manager of the company. Most recently he was sales manager. **J. Edward Healey,** sales department executive, will be assistant general sales manager.

GOODYEAR

Charles S. Pyne has been added to the Mid-West territory of the firm's Chemical Sales Division. He will make his headquarters in Minneapolis, Minn., and will service the paint and coatings industries in Minnesota and Wisconsin. Mr. Pyne joined Goodyear's training squadron in 1951 following his graduation from Tri-State College in Angola, Ind., where he received a B.S. degree in chemical engineering. He was assigned to Goodyear's Chemical Division in 1952.

C. S. Pyne

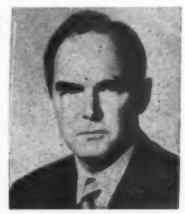
CAREY MFG.

Roy W. Davis has been appointed sales manager of the Paints and Emulsion Department of the Philip Carey Mfg. Company, Cincinnati, O. Until his present assignment, he had been a salesman in the Carey Cleveland district. Mr. Davis joined the firm in 1936 as a member of the Order Department. He was subsequently made manager of the department and then entered the sales force in 1945.

Roy W. Davis

PATTERSON FOUNDRY

Wayne Schoonover, who has served in an engineering capacity in the petroleum industry for the past 18 years, has been appointed manager of the Patterson Foundry & Machine Company's new district sales office in Houston, Texas. The office is located at 324 Hathaway Street in Houston. The new office was established to provide faster service in the chemical and allied industries.



Wayne Schoonover

A-D-M

Clyde C. West has been appointed a member of the technical sales staff. During his 15 years in the protective coatings industry, he has been associated with several firms as a chemist, plant manager, technical representative and manager of resin research. Mr. West is a member of the American Chemical Society, the American Institute of Chemists and the Society of the Plastics Industry.

C. C. West

N.A.M.

H. C. McClellan, president of the Old Colony Paint & Chemical Company, has been elected president of the National Association of Manufacturers at the 58th Annual Congress of American Industry held recently. He is also a past-president of the Los Angeles Paint, Varnish and Lacquer Association, and a past member of the Association's Executive Committee.

SYLOID® 162

Davison's NEW Alkyd-Urea Flatting Agent, for Synthetic Finishes, gives you

MORE FLATTING POWER AT LOWER COST

Laboratory tests and actual use tests have proven that **SYLOID 162:**

- can be ground in one-quarter the time required by other varnish flatting agents.
- the flatting power is two to three times greater than existing materials.
- twice as much can be ground in a single mill charge.
- the high and low tones are not destroyed as with present varnish flatting agents.
- films are tough, durable and mar resistant.
- has an exceptionally high chemical purity.
- chemical properties are controlled to insure uniform performance.
- there is no "seeding".

For further information on SYLOID 162—the alkyd-urea varnish flatting agent that gives you better performance at lower cost—write

Progress Through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

Producers of: Catalysts, Inorganic Acids, Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole Producers of DAVCO® Granulated Fertilizers

"Maybe we ought to get a faster-drying paint"

To increase drying speed of *your* finishes, formulate with AROPOL copolymer resins. In both air-drying and baking finishes, AROPOL 865 and 880 dry much faster than conventional short or medium length alkyds. Both through-drying and tack-free time are shorter. AROPOL 880 approaches nitrocellulose lacquers in speed of cure. AROPOL 865 is only slightly slower. Both resins are specifically recommended for Specification MIL-E-10687 finishes. And of course for finishes for farm implements, toys, hardware, machinery, metal furniture, and other applications where fast drying is essential.

AROPOLS give you other advantages, too. Pale color – a big factor in light shades. Superior color retention. Better resistance to water and alkali than alkyds. Good resistance to solvents, greases, fruit juices, etc. Unusually tough, abrasion-resistant films that retain flexibility and gloss over long aging periods.

Specifications

	AROPOL 865	AROPOL 880
Nonvolatile	49-51%	59-61%
Solvent	Petroleum Spirits	Xylol
Viscosity (G.H.)	Z-3 — Z-5	Z — Z-3
Acid No. of Nonvolatile	3-8	3-8
Color (Gardner Std. '33)	8 max.	8 max.
Wt. per gallon at 25° C.	7.75 — 7.85 lbs.	8.25 — 8.35 lbs.
Resin Modification	None	None
Oil Length	Short — Medium	Short

AROPOL 865 and 880 are available in tanks or drums. Also available are AROPOL 866 and 881, alternative resins with similar properties for specialty purposes.

Write, wire or telephone your nearest U.S.I. office today for information on these outstanding copolymer resins — or on any resin in the complete U.S.I. line.

U.S. INDUSTRIAL CHEMICALS CO.

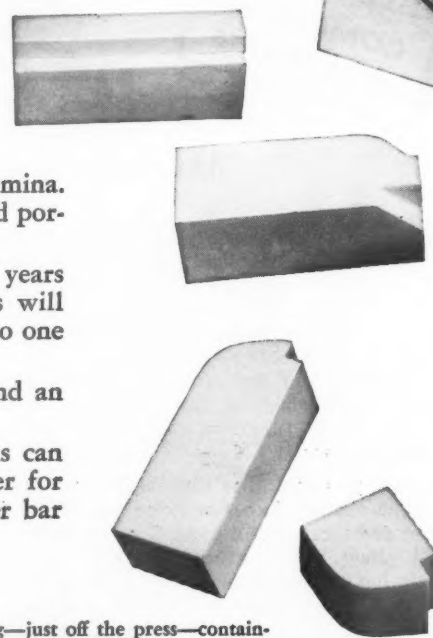
Division of National Distillers Products Corporation
120 Broadway, New York 5, N. Y.

Branches in All Principal Cities

McDANEL

Super High Density Mill Linings

A Superior Ceramic Lining for Ball Mills



These bricks contain a high percentage of Alumina. They are harder, and last longer than the standard porcelain bricks, and the pick up due to wear is less.

Authenticated records of tests over a period of years prove that McDanel Super High Density Bricks will outwear Porcelain Linings two and a half times to one under average routine use.

This means that fewer relinings are required, and an important saving in down time.

McDanel Super High Density Mill Lining Bricks can be furnished, on special order, with double taper for use in conical continuous mills, and also in lifter bar shapes for special needs.

Write today for our new catalog—just off the press—containing complete data on McDanel Porcelain Products

McDANEL *Industrial* PORCELAINS

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

Tank & Dryer Linings—Special Mill Lining Shapes—Porcelain Grinding Jars & Mills—Metal Covered Grinding Jars & Mills—Door Lining Blocks

L. W. Siegle F. B. Johnson

NATIONAL ANILINE

Leon W. Seigle and **Fred B. Johnson,** have been named Manager and Assistant Manager, respectively, of Intermediate Sales. They will make their headquarters in New York, N. Y. Since joining the firm in 1939, Dr. Seigle has served in the Research & Development Department as a research chemist and later as a section leader. Mr. Johnson joined the firm in 1934. He will be responsible for the co-ordination of production and sales of the fir .'s new intermediate chemical products.

VULCAN STEEL

Ray I. Mitchell has been appointed Sales-Service Representative for Vulcan-Steel Container Co., Birmingham, Ala. He will headquarter at the company's main offices and plant in Birmingham, and will contact users of steel pails and drums throughout the South as a special representative. Mr. Mitchell served in the Navy during World War II, and has been doing special sales work since.

R. I. Mitchell

PENNSALT

W. J. Stoddard has been named District Supervisor in the Michigan District for the Metal Processing Department. In this new position, Mr. Stoddard will supervise sales and service activities in the Michigan area for the firm's metal cleaners and Fosbond phosphate coatings. He has been with Pennsalt 23 years.

HOOKER ELECTROCHEMICAL

Dr. Samuel J. Nelson has been appointed to the firm's resins and plastics group as a chemist. Prior to joining Hooker, he was associated with the U. S. Rubber Company.

John E. Wier, also a chemist, has joined Hooker's resins and plastics group. He is the author of several scientific publications, particularly relating to polyester resin laminates.

THIBAUT & WALKER

W. George Parker has appointed President of Thibaut & Walker Company, Inc., Newark, N. J., by the company's directors. He succeeds S. C. Robison. Mr. Parker is a graduate of Pennsylvania State College. Prior to his appointment he was a member of the board of directors and technical director of Cook & Dunn Paint Corporation, also of Newark. Thibaut & Walker manufactures alkyds, oleoresinous vehicles and paint specialties.

W. G. Parker

COMMERCIAL SOLVENTS

Dean J. Kutchera has been assigned to the sales staff of the Industrial Chemicals Division in the Detroit district office.

Wallace N. Davis, a chemist, has been named to the Industrial Divisions Chicago district office.

James F. McCarthy has also been assigned to the Chicago district office.

RHEEM MFG.

Harry H. Filler has been named National Container Products Manager in charge of Rheem's container and bulk packaging products. He will make his headquarters at the firm plant in Chicago. Mr. Filler was formerly in charge of Rheem's East Coast operations.

SMELLS DON'T SELL!

be sure you specify...

AdcO ODORLESS ALKYUM No. 185 S

Now, a 100% pure alkyd that is completely free of rosin and resin derivatives. Reduced with an all odorless solvent, it may be used to produce **FLATS . . . SEALERS . . . PRIMERS and ENAMEL UNDERCOATERS** *that will . . .*

- Dry hard in 4 to 6 hours.
- Have excellent ease of brushing and non-penetration
- Produce a rugged, scrubbable surface
- Maintain long wet edge time (12 to 20 minutes)
- Show no brush marks
- Impart excellent, non-yellowing color retention
- Maintain exceptional suspension properties and package stability

AdcO 185 S SPECIFICATIONS

Wt. Per Gal.	6.9 lbs.
Viscosity	Z2-Z5
Non-Volatile	25%
Type of Oil	Soya
Percent of Oil	49-51%
Color	4-7
Resin or Rosin Modifiers	NONE

SEND FOR SAMPLE

AdcO CHEMICAL CO.
148-154 Rome St., Newark 1, N. J.

Send me full information and sample of AdcO Odorless Alkyum, 185 S.

NAME.......
FIRM.......
ADDRESS.......
CITY & STATE.......

148-154 ROME STREET, NEWARK 1, N. J.

AdcO Chemical Company

A DEPENDABLE SOURCE OF SUPPLY FOR QUALITY GRINDING VEHICLES

Duplication or Coordination?

A Timely Question for Management

Developing basic data on Vinyl Acetate—the chemical raw material that promises better paints, paper coatings and textile finishes.

In laboratory pilot plant, customer's revised resin formulation is evaluated for increased yield, improved quality.

Development of butylated resins for baked enamels and alkyd resins for paints, using new materials and techniques.

Today, with every manufacturer looking for product improvements...new markets...new products...broader applications, there's a premium on technical talent, a price on time. Duplication of effort can be fatal...coordination promises success.

Nowhere is this better appreciated than in the industries built on chemical raw materials.

How best to use a chemical raw material... how to improve processing efficiency... how to profit through the selection of more economical raw materials... how to gain by the adoption of a more efficient form of the raw material? These are questions that are best answered by consulting with the supplier, a "specialist" who can draw on years of wide field experience with the chemicals he produces.

Celanese, a major supplier of organic chemicals for many industries, maintains the Technical Service and Application Laboratories to furnish this specialized technical assistance to its customers. By pointing the way to more efficient use of basic and intermediate materials, the Celanese Technical Service and Application Laboratories becomes a member of the manufacturer's research and development team — enabling his technical staff to intensify their development of new markets and new products.

More and more users of Celanese* Solvents, Plasticizers and Intermediates are encouraging their technical personnel to utilize the Celanese Technical Service and Application Laboratories. These manufacturers of paints, plastics, paper products, textiles, adhesives and bonding agents, anti-freeze, gasoline and lube-oils, brake and hydraulic fluids, wire and cable insulation, and floor coverings are developing better products in shorter time.

The Celanese Technical Service and Application Laboratories is ready to work with your staff..."punch the clock" at your plant.

Celanese Corporation of America
Chemical Division, Dept. 558-A
180 Madison Avenue, New York 16

Celanese CHEMICALS

*Reg. U. S. Pat. Off.

GOODYEAR

Herman R. Thies has been promoted to general manager of all chemical products, a newly created position. He joined Goodyear in 1930 as a rubber research compounder. Most recently he was manager of the firm's chemical division.

H. R. Thies

James M. Jones has been appointed to the South Atlantic Sales Territory of the company's chemical Division. He will headquarter in Philadelphia and will service the plastic and rubber industries. Mr. Jones joined the firm in 1951.

J. M. Jones

R. P. Dinsmore

Dr. Ray P. Dinsmore, vice president in charge of research and development of Goodyear, has been elected a director of the American Institute of Chemical Engineers. He has been a member of the Institute since 1927.

BENJAMIN MOORE

F. C. Wrede has been named assistant treasurer; **E. W. White,** personnel manager; **G. P. Berger,** director of engineering research; **Gabriel Malkin,** chief engineer; **H. J. Shea,** manager of the Cleveland branch; **V. P. Hengesbach,** assistant manager of the St. Louis branch; **E. L. Stakebake,** assistant manager of the Denver branch; **W. F. Rose,** assistant manager of the Cleveland branch; **T. A. Miller,** sales manager, Cleveland; **L. J. Dauchert,** credit manager, New York; **A. C. Borch,** cashier, New York.

A-D-M

Carl Luther has been appointed head of the newly formed Sales Training Department. He had been in charge of packaged linseed oil sales.

McCLOSKEY VARNISH

William H. Jarden, Jr., has been elected chairman of the board; **William A. McKnight,** president and treasurer of the parent company and its subsidiaries; **George H. Gough, Jr.,** resident manager of the North West (Portland, Ore.) Company, and **Frank C. Peck,** national trade sales manager, both vice presidents of the Philadelphia Company.

AMERICAN CYANAMID

Kenneth H. Klipstein has been named general manager of the newly created Research Division. This division will be responsible for the operation of the Stamford Research Laboratories under the direction of Dr. J. T. Thurston. It will also supervise other research programs not the direct responsibility of operating divisions.

L. C. Duncan has been appointed general manager of the Organic Chemicals Division, and V. E. Atkins, Assistant General Manager. The Division will merge the activities of the Petrochemicals and Calco Chemical Divisions.

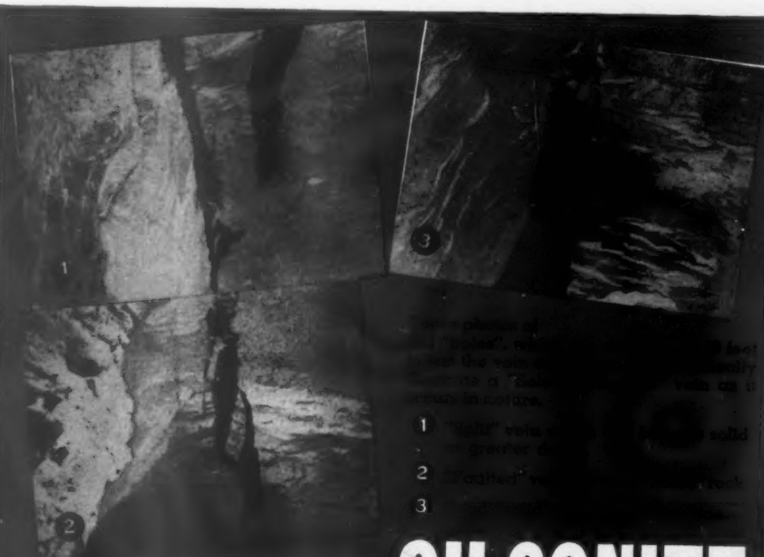
A. B. Clow has been named general manager of the newly formed Fine Chemicals Division.

A. R. Loosli has been appointed assistant general manager of the Division. This unit will operate the Princeton, N. J., plant.

J. Allegaert has been named general manager, and **A. B. Hettrick,** assistant general manager, of the newly formed Pigments Division. This division will be responsible for the production and sale of titanium dioxide and other pigments.

KOPPERS COMPANY

William J. Gort and **Roger MacDonald** have been named Development Coordinators in the Chemical Division. They will guide laboratory and pilot plant development work at the various plants of the Chemical Division, and preparation of technical programs to be carried out by plant personnel.



GILSONITE

Select the one you want from the following specifications.

	ZECO No. 11	ZECO No. 147	"JET"	BRILLIANT BLACK
Melting Point	270/280°F.	290/305°F.	320/330°F.	340/360°F.
Viscosities @ 10 c.c.	11-14 sec.	17-22 sec.	30-35 sec.	42-50 sec.
@ 50 c.c.	67-77	240-270	270-300	300-350
Color	18	18	30	40

About BRILLIANT BLACK — the only high melting point Gilsonite Selects that runs uniform with respect to melting point and viscosity. Produces vehicles having good body and coverage at low solids content.

Carload and less carload stocks available for immediate shipment.

Z CO

G. S. ZIEGLER & COMPANY

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AGENTS AND WAREHOUSE STOCKS IN PRINCIPAL CITIES

VELSICOL RESINS AD·21 AB·11·2

For High Lustre, Good Leafing Aluminum Paints

Velsicol Resins AD-21 and AB-11-2 are especially suitable for economical excellent quality aluminum vehicles and ready-mixed aluminum paints. These neutral hydrocarbon resins are soluble in both aliphatic and aromatic naphthas, and are compatible with bodied vegetable and marine drying oils. They impart fast-drying characteristics. Solutions of the resins have high surface tension properties which promote leafing and flooding of aluminum pigment. The non-acidity of the solutions favors long leaf retentivity. AD-21 and AB-11-2 are available in either solid or solution form. For information and advice about their use, write to the Velsicol Corp. Technical Department.

OTHER SUGGESTED APPLICATIONS FOR VELSICOL RESINS

- Floor and trim vehicles.
- General utility varnishes.
- Traffic paints.
- Extenders for 100% oil soluble phenolic resins.
- Extenders for Chlorinated rubber.
- Metal primers.
- Drum coatings.
- Decorative can enamels.
- Grinding liquids.

PROPERTIES

- Low degree of solvent retentivity.
- Non-acidic.
- Non-saponifiable.
- Coatings resistant to water, aqueous acids and alkalis.
- Soluble in aliphatic and aromatic naphthas.
- Compatible with vegetable and marine drying oils.
- Vehicle films are hard, flexible and adherent.
- Resin solutions promote excellent leafing and flooding of aluminum pigment.

PETROLEUM DERIVED CHEMICALS
VELSICOL
SERVING BASIC INDUSTRIES

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330 East Grand Avenue, Chicago 11, Illinois

Export Division
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This

is

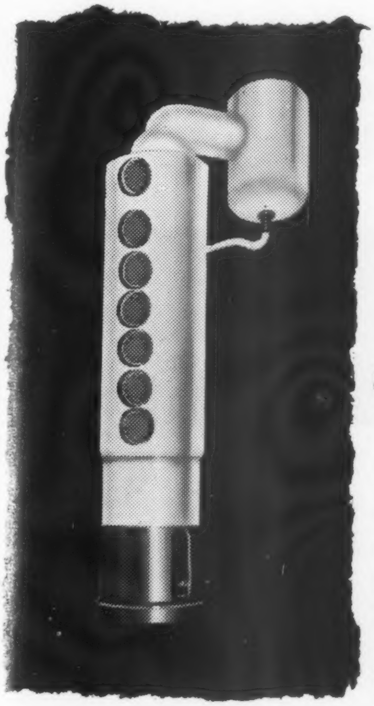
our

source

The Distilled Soya Bean Fatty Acids which A. Gross & Company produces from the soya bean exceed the demands of alkyd resin producers for fatty acids of light color which have minimum color change under heat. In addition, of particular interest is the low unsaponifiable content of GROCO Soya Bean Fatty Acids.

A. GROSS & COMPANY

295 Madison Ave., New York 17, N. Y. Factory, Newark, N. J. Distributors in Principal Cities. Manufacturers Since 1837



let

A. GROSS & Company

be

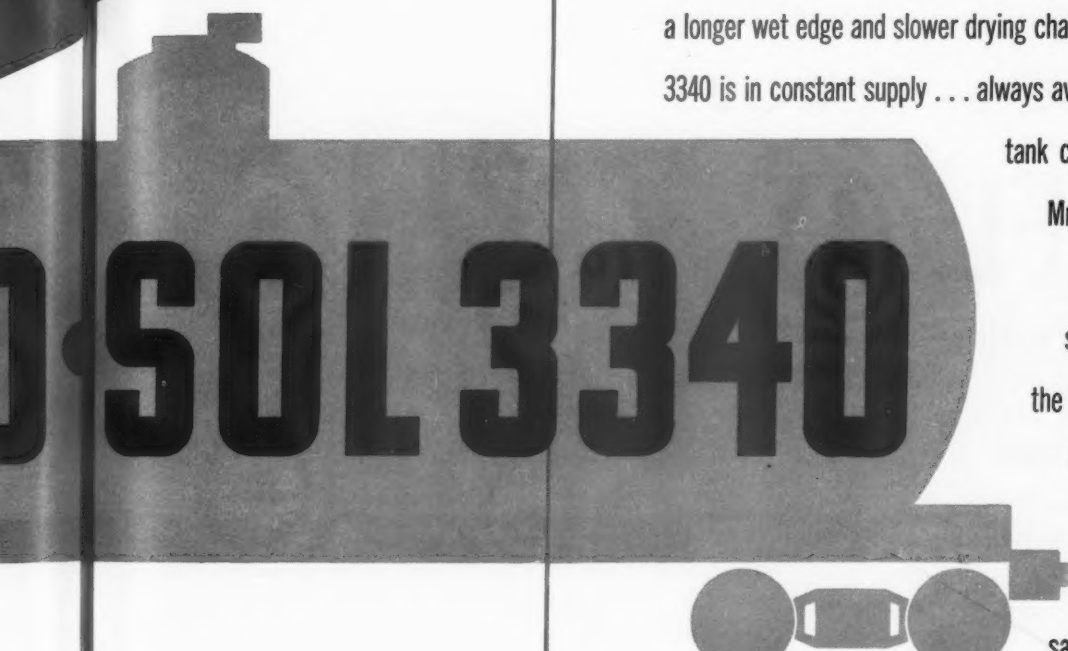
yours

If you desire quality and uniformity, A. Gross is unmatched in the field. Why get less than maximum performance from the materials you produce? Let A. Gross & Company be your source for Soya Bean Fatty Acids.

	GROCO 28	GROCO 27
Titre	25 — 30 C.	25 — 30 C.
Color 5¼" Lovibond Red	2 — 4	5 — 10
Color 5¼" Lovibond Yellow	10 — 30	30 — 60
Color Gardner 1933	2 — 4	3 — 5
Color Gardner 1933 — After Heat Test to 500 F.	4 — 7	
Unsaponifiable	0.3% — 1.5%	3.0% max.
Saponification Value	198 — 202	195 — 200
Acid Value	197 — 201	194 — 199
Iodine Value (WIJS)	125 — 135	122 min.

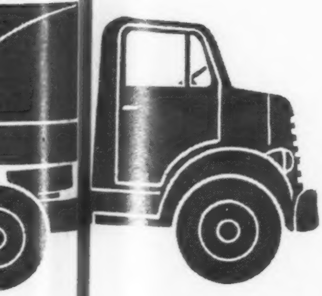
Send for samples and our catalog "Fatty Acids in Modern Industry."


ROCO·SOL 3340
42% more gallons for your
solvent dollar with ROCO-SOL 3340
semi-odorless solvent
ROCO·S



Roco-Sol semi-odorless is a high quality product of the new modern Roosevelt Refinery. Thorough tests of odorless paints made with Roco-Sol solvent prove that they are completely acceptable to the consumer. Roco-Sol 3340 is today being used successfully by one of the nation's largest resin manufacturers. It is especially recommended for paints requiring a longer wet edge and slower drying characteristics. Roco-Sol 3340 is in constant supply . . . always available for quick assured tank car or transport delivery.

Mr. Paint Manufacturer, if you are looking for a solvent that will give you the same high quality paint that you are now making and you are interested in 42% solvent savings, contact us today.



WRITE TODAY FOR FREE SAMPLE OF ROCO-SOL 3340

SPECIFICATIONS: ROCO-SOL 3340

Initial Boiling Point	345° F.
End Point	405° F.
Kauri Butanol Number	31

ROOSEVELT

OIL & REFINING CORPORATION

MT. PLEASANT, MICHIGAN

63

G-E

E. Willard Winslow has been appointed manager of Advertising and Sales Promotion, Marketing Section, Silicone Products Department with headquarters in Waterford, N. Y. He joined the firm in 1946 as a sales trainee. Prior to his present assignment, he was an advertising supervisor in the Chemical Division Advertising and Sales Promotion section in Pittsfield, Mass.

E. W. Winslow

GLIDDEN

James C. Tansey has been named manager of the firm's New England Division with headquarters in Cambridge, Mass. He was formerly manager of Glidden's Scranton (Pa.) metropolitan branch.

George B. Richardson has been appointed national accounts representative. He succeeds Ian L. Carmichael, who resigned from the company to become vice president and general manager of the Warren Refining & Chemical Company of Cleveland. Mr. Richardson joined Glidden in 1950 as a sales trainee.

Lowell Harrison Miller, has been named Pacific Region industrial representative in Los Angeles. He began his career in the industrial finishes industry in 1925, with the Dodge Bros. Corporation. Mr. Miller will make his offices in Los Angeles.

IND'L. FILTER & PUMP

George J. Dawson has been named factory district representative in sales and service engineering for the Industrial Filter & Pump Manufacturing Company, Chicago. He will cover Pennsylvania and Western New York, from the firm's new branch offices in Pittsburgh. **Gil Valentine** has been assigned to cover Michigan from Industrial Filter's new Detroit office.

G. J. Dawscn

G. Valentine

J. Filkins

James Filkins will cover Texas and Oklahoma from the firm's new Dallas office.

HERCULES

F. H. Crymes has been appointed district manager of the firm's Synthetic Department. Formerly manager of the San Francisco district, Mr. Crymes succeeds J. G. Little who has been named a sales manager in Wilmington, Del.

W. F. Power has been named district manager in San Francisco. He has been a technical sales representative in the New York office for the past eight years.

F. W. Beavers has been appointed Cincinnati, O., district manager. Cincinnati, formerly operated as a sub-office is now designated as a new district sales office.

J. O. Small has been named an assistant director of sales of the Synthetics Department.

J. G. Little, who has been manager of the Department's Chicago sales district, has been appointed sales manager in charge of products for paint, varnish and lacquer and other industries.

DIXIE PAINT

Edward J. Fallon has been named advertising manager. He has been with the Dixie Paint & Varnish Company, Brunswick, Ga., for ten years.

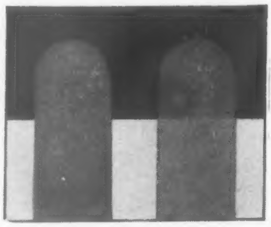
SEALED or POROUS

FAFL

IS FOR YOU

IF YOU WANT A ONE COAT FLAT WITH

- COLOR UNIFORMITY
- SHEEN UNIFORMITY
- PACKAGE STABILITY



*FAFL Alkyd Paint — AVERAGE Flat Paint

Black section in above illustration is a sealed surface. Light section is a porous surface.

VISCOSITY........V-Y
NON VOLATILE..30%±1%
COLOR...........8 Maximum
ACID NUMBER....10 Maximum (on solids)
WEIGHT per gal....7.3 lbs.
TYPE..............Pure drying oil alkyd.
USES..............Interior flats, primer sealers, enamel undercoaters, semi-gloss, etc.

The finishes produced with *FAFL are easy brushing, highly washable and very durable. They have shown excellent package stability and suspension properties. May also be used for primer sealers, undercoaters and semi-glosses.

*FAFL is an alkyd flat vehicle.

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LONG ISLAND CITY 1, NEW YORK
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Manufacturers of:
ALKYDS — SPECIFICATION LIQUIDS — SPAR VARNISHES — SYNTHETIC VARNISHES — GLOSS OILS — ESTER GUMS — SOLUTIONS — PROCESSED OILS — RESIN SOLUTIONS — DRIERS GRINDING LIQUIDS—MARINE FINISHES—ARCHITECTURAL VEHICLES—INDUSTRIAL VEHICLES

FOR THE COATING INDUSTRY:

EASTMAN OFFERS TECHNICAL DATA ON

Eastman's new low-viscosity cellulose acetate butyrate is generating tremendous interest among users and formulators of protective and decorative coatings. Its high solubility and slow viscosity build-up in solvents such as ethyl alcohol and toluene bring to finishers the unique advantages of cellulose acetate butyrate in a form that permits its use in economical formulations requiring a high non-volatile content.

No other easily sprayable film former exhibits, to such a high degree, the stability of half-second butyrate in the presence of ultra-violet light and the outstanding retention of its initially low color, high strength and flexibility, both indoors and out.

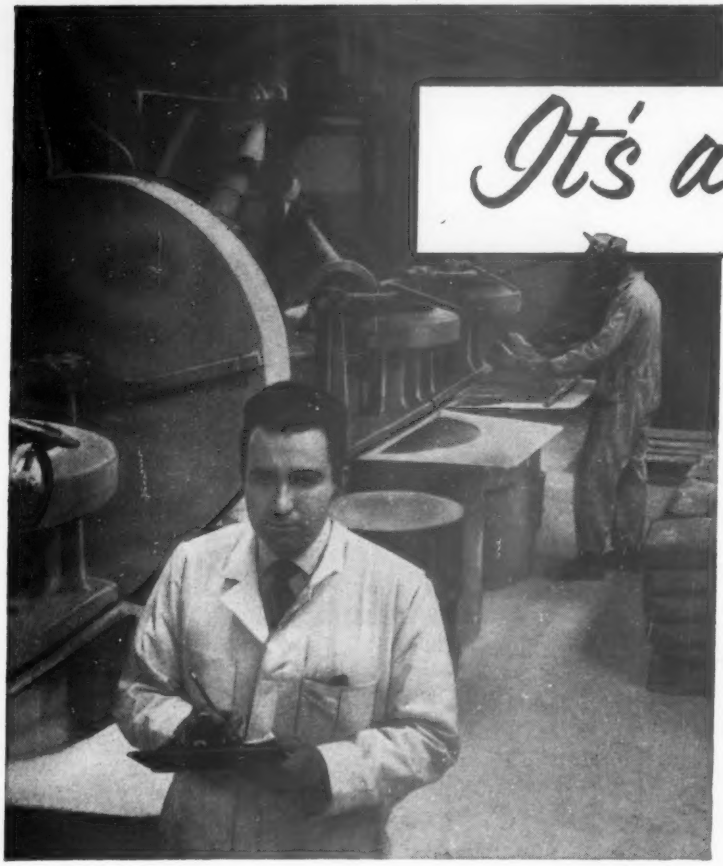
To further acquaint you with half-second butyrate and to assist you in evaluating it for your own requirements, we have prepared a sixteen page booklet containing comprehensive data on the compatibility of this new film former with some 125 natural and synthetic resins, oils and waxes. This data includes such factors as hardness, tensile strength, flexibility and the effects of underwater immersion. Also included are formulation suggestions for wood, paper, metal and plastic finishes, heat-sealing adhesives and melt coatings.

WRITE FOR YOUR COPY TODAY! SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. **West Coast: Wilson Meyer Co.,** San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.

EASTMAN CHEMICAL PRODUCTS, INC.
Kingsport, Tennessee

PLEASE SEND ME:
- ☐ Half-second butyrate booklet
- ☐ Sample of half-second butyrate

NAME ....
POSITION ....
COMPANY ....
STREET ....
CITY .... ZONE .... STATE ....



It's adaptable...

...that's why

Dutch Boy*

Basic Silicate White Lead

"45X"

is the factory manager's favorite

In exterior paint formulation, you can use "Dutch Boy" Basic Silicate White Lead "45X" to advantage to perform different functions.

It is this adaptability, plus economy, that makes "45X" the factory manager's favorite . . . as well as the paint maker's and the factory chemist's.

Use "45X" in white House Paints, for example, and you improve self-cleaning properties. Its wetting ability allows the rain to spread over the painted surface, thus giving it a better chance to wash off the dirt.

Use "45X" in tinted House Paints, and it helps make the film more durable, more resistant to color change. Also, because of its hydrophilic properties, "45X" promotes dirt removal and helps keep colors fresh and clean.

Use adaptable "45X" in Primers, and you get the lead soaps that increase adhesion. *And* the water resistance needed to maintain the paint film's adhesive bond which helps prevent peeling.

Use "45X" in Porch and Floor Enamels, and it plasticizes the film . . . increasing abrasion resistance. More than that, it forms lead soaps that contribute to the flexibility and water resistance of the film, and thus improve adhesion.

As its wide use by leading paint makers proves, "Dutch Boy" Basic Silicate White Lead "45X" is "lead" at its adaptable, economical best. Try it yourself.

More economical, too!

In adaptable "Dutch Boy" Basic Silicate White Lead "45X," the reactive portion of each pigment particle is concentrated at the surface. This makes available proportionately larger amounts of "lead." So you use fewer pounds than with other white lead types.

National Lead Company: New York 6; Atlanta; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.).

*Reg. U. S. Pat. Off.

PATENTS

Conducted by

Lancaster, Allwine & Rommel

PATENTS AND COPYRIGHTS

424 Bowen Building,
Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Hydrolyzable Siloxanes

U. S. Patent 2,658,908. Siegfried Nitzsche and Ewald Pirson, Burghausen, Upper Bavaria, Germany, assignors, by mesne assignments, to Wacker-Chemie G. m. b. H., Munich, Germany.

The method for the production of siloxanes which contain substituents of the group consisting of alkoxy, aryloxy and acyloxy which comprises maintaining

$$R_mH_nSiO_{\frac{4-m-n}{2}}$$

(1) a siloxane of the average general formula in which R represents hydrocarbon radicals free of aliphatic unsaturation, m has a value of from 1 to 2, inclusive, and n has a positive value up to and including 1,and(2) a reactant of the group consisting of alcohols, phenols and carboxy acids in contact with an ansolvo acid, whereby a substituent of the group consisting of alkoxy, aryloxy and acyloxy is substituted for the hydrogen of said siloxane with the liberation of free hydrogen.

Catalytic Hardening of Phenolic Resins

U. S. Patent 2,655,490. Lawrence F. Sonnabend and Alvin M. Edmunds, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware.

A composition comprising a liquid, water-insoluble condensation product of phenol and formaldehyde, which condensation product is in amount sufficient, when hardened, to set the entire composition to a rigid, solid mass, and a minor amount of a hardening agent consisting essentially of a mixture of trichloroacetic acid and benzene sulfonyl chloride containing from 33 to 98 per cent by weight of the latter.

Insoluble Coating

U. S. Patent 2,657,155. Jan Lolkema, Hoogezand, Netherlands, assignor to Naamlooze Venootschap: W. A. Scholten's Chemische Fabrieken, Groningen, Netherlands, a corporation of the Netherlands.

A process of coating a water insoluble, water repellent coating upon the surface of a base material, comprising, applying an aqueous solution of a water soluble salt of an acid selected from the group consisting of starch ether carboxylic acid and starch ester carboxylic acid to said surface of said base and thereafter coating the so treated base with an aqueous solution of a polyvalent metal salt selected from the group consisting of water soluble salts of aluminum, ferric iron, chromic chromium, and tin, and forming a water insoluble salt with the acid applied in the first coating, said metal salt solution having emulsified therein a water repellent paraffin material.

Coating Composition

U. S. Patent 2,658,003. Louis E. Klein, St. Louis, Mo., and August R. Hempel, Dayton, Ohio, assignors to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A coating composition comprising a drying vehicle and an effective amount up to about 2 per cent by weight of metal, based on the weight of the drying vehicle solids, of a drier comprising a polyvalent drier metal salt of the monoalkylesters of diisobutenylsuccinic acid and triisobutenylsuccinic acid, wherein the alkyl group contains from 1 to 4 carbon atoms, inclusive.

NEVILLE

Now Available

LX-782

An Oxidizing Petroleum Resin

Rock-Bottom Price

7¢ lb.*

*in Drums F.O.B Neville Island, Pa.

Specifications

Melting Point (cube in mercury).....110-130° C
Color (Neville Color Scale)......9-13
Acid Number.........less than 1
Saponification No.........0
Iodine Number........130-160

Uses

Fast Drying Aluminum Paints
Drum Paints (other than light colored)
Porch and Deck Paints
Pipe Coating Oils
Metal Primers
Chassis Blacks

LX-782 is a low-cost, oxidizing, heat reactive hydrocarbon resin. Varnishes made by heat reacting LX-782 with drying oils at a temperature of about 550° F have these worthwhile characteristics . . . low cost, fast drying, good light stability, and excellent resistance to acids, alkalis, alcohols, gasoline, grease, water.

Write today for samples

NEVILLE CHEMICAL CO.

PITTSBURGH 25, PA.

Plants at Neville Island, Pa., and Anaheim, Cal.

P-51

MICA WATER-GROUND
"At Its Best"

Concord Mica most admirably suited for all Paint Formulations especially "LATEX EMULSION".
PURITY: Uniformly ground from imported Mica flake washed to remove all impurities.
COLOR: Extremely white.
AVAILABILITY: Deliveries from stock.

Send for samples and prices
CONCORD MICA CORPORATION
35 Crescent St. Penacook, N.H.

HYDROCARBON
PANAREZ
RESINS

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PHYSICAL PROPERTIES

Resin	Color Gardner	Softening Point, °F	Iodine Number	Acid Number
PANAREZ 3-210	9	200-220	230	0-1
PANAREZ 6-210	11	200-220	170	0-1
PANAREZ 7-210	18+	200-220	150	0-1
PANAREZ 8-210	18+	200-220	130	0-1
PANAREZ 12-210	16	200-220	60	0-1

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CALENDAR OF EVENTS

Jan. 25-28, 1954. Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, Ill.

Jan. 26-28. 1954. 27th Annual Industry Convention of Soap & Glycerine Producers, Inc., Waldorf-Astoria Hotel, New York City.

Feb. 25-26, 1954. Conference of the Protective Coatings Div. Chemical Institute of Canada' Toronto and Montreal, Canada.

Mar. 3-5, 1954. 18th Annual Convention of the Southern Paint and Varnish Production Club, Buena Vista Hotel, Biloxi, Miss.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmillers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Buildng.

Golden Gate, Last Monday, E. Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Wednesday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 3rd Tuesday, Forest Park Hotel.

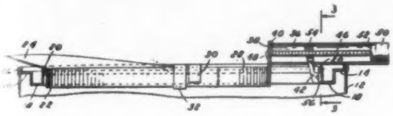
Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

Pouring Attachment For Paint Cans

U. S. Patent 2,659,519. John W. Allen, Detroit, Mich.



A pouring attachment for paint cans and the like comprising, in combination, a ringshaped member of a size to be received within the rim of a paint can and lie in the plane thereof, said member having a segmental portion of its perimeter formed of a band of flexible radially expandible material, a pouring lip secured to said band and conforming to the curvature thereof and being arranged to extend upwardly and outwardly over the adjacent portion of the rim of a paint can in which the ring-shaped member is received, an elongated body secured at one end to the member in diametrically opposite relation to the lip and extending radially outwardly from the member, said body lying in a plane offset upwardly from that of the ring-shaped member to overlie the rim of a paint can in which the latter is received and project outwardly therebeyond, a depending element carried by the body and shiftable into engagement with the rim of a paint can in which the ring-shaped member is received, and manually controlled means connected to said element and operable to cause the element to shift into engagement with the rim of the paint can and react therewith to expand said lip carrying portion of the ring-shaped member into sealing engagement with the rim.

Melamine From Biuret

U. S. Patent 2,658,892. Joseph H. Paden, Stamford, and Johnstone S. Mackay, Old Greenwich, Conn., assignors to American Cyanamid Company, New York N. Y., a corporation of Maine.

The process of preparing melamine from biuret which consists of heating biuret at a temperature in the range of 300–350°C. in a closed vessel under a pressure of at least 100 lbs. per sq. inch, until melamine is formed and recovering the so-formed melamine.

Stabilized Vinyl Resin

U. S. Patent 2,654,718. Oliver J. Grummitt and Robert E. Blank, Cleveland, and Dean Marsh, Cleveland Heights, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio, a corporation of Ohio.

A composition of matter comprising a stable homogeneous mixture of from about 20% to 70% by weight of disodium hydrogen phosphate dodecahydrate in a bodied glyceride oil having a viscosity of from about 40 to 1100 seconds (Gardner-Holdt), the water present in said homogeneous mixture being chemically associated with the disodium hydrogen phosphate salt in the ratio of 12 mols of water to 1 mol of the disodium hydrogen phosphate salt and said homogeneous mixture being dispersed in a halogen-containing resinous polymeric material in the proportion of from .1 to 10 parts per 100 parts of resin.

Sizing Medium

U. S. Patent 2,658,835. Roy P. Wymbs, Fredericksburg, Va., assignor to American Viscose Corporation, Wilmington, Del., a corporation of Delaware.

An aqueous softening and sizing medium suitable for application to gel films of regenerated cellulose, said medium comprising 5% glycerol, 0.1% colloidal silica, and 0.1% of a condensate of stearic acid with ethylene oxide containing 50 ethylene oxide units per molecule.

Linear Polyamides

U. S. Patent 2,659,713. Eugene Edward Magat, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware.

A process for producing synthetic linear polyamides which comprises reacting an organic dinitrile of the formula: $NC—R'_m—CN$ wherein R' is a divalent radical from the group consisting of hydrocarbon and unreactive heterocyclic radicals and *m* is a numeral from 0 to 1 and an N,N'-dimethylolamide of the formula

$HO—CH_2—NH—CO—R—CO—NH—CH_2—OH$

wherein R is a divalent radical from the group consisting of hydrocarbon, unsubstituted heterocyclic, and halogen-substituted hydrocarbon and heterocyclic radicals, in the presence of a strong acid

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catalyst as the reaction medium, the concentration of the organic dinitrile and N, N'-dimethylolamide together constituting from 2 to 40% by weight of the reaction mixture, and continuing the reaction until a polymer of the desired intrinsic viscosity is obtained.

Blends of Elastomers With Phenolics

U. S. Patent 2,657,185. David W. Young, Roselle, and Raymond G. Newberg, Cranford, N. J., assignors to Standard Oil Development Company, a corporation of Delaware.

A composition of matter comprising 30 to 60 parts of a resin prepared by condensing formaldehyde with an aliphatically substituted phenol having as its only substituent a C_{10} to C_{21} hydrocarbon side chain selected from the group consisting of alkyl radicals, monoolefinic radicals and diolefinic radicals; in combination with 70 to 40 parts of a solid rubbery copolymer of 20 to 35 percent of acrylonitrile and 80 to 65 percent of butadiene-1, 3, the resin having been incorporated in the copolymer while the resin was in a fusible state.

Polyvinyl Chloride Resin

U. S. Patent 2,657,186. David X. Klein, Passaic, and Mark N. Curgan, Clifton, N. J., assignors to Heyden Chemical Coporration, New York, N. Y., a corporation of Delaware.

A polyvinyl chloride resin composition containing a plasticizer, said composition having its viscosity lowered by an agent selected from the group consisting of long chain fatty acid esters of polyoxyalkylenes, long chain fatty ethers of polyoxyalkylenes, partial long chain fatty acid esters of polyoxyalkylene ethers of polyhydric alcohols, polyoxyalkylenes having an average molecular weight of at least 1500, and nuclear long chain alkylated polyoxyalkylene ethers of phenols.

Alkoxy Silane Liquid

U. S. Patent 2,660,538. Harold Garton Emblem, St. Helens, England, Clifford Shaw, Johannesburg, Transvaal, Union of South Africa, and William Edwin Langrish-Smith, Burwash Common, England; said Emblem assignor to said Shaw and said Langrish-Smith.

A liquid composition comprising a lower alkoxy silane characterized only carbon-oxygen-silicon linkages, and a small proportion of an organic base having a pKa value greater than 7 and selected from the class consisting of alicyclic and saturated aliphatic organic bases having a carbon atom content of from 2 to 12 carbon atoms per molecule and having only carbon, hydrogen, oxygen and nitrogen atoms in the molecule.

Preparation of Melamine

U. S. Patent 2,658,891. Johnstone S. Mackay, Old Greenwich, Conn., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine.

The method comprising heating a reaction mass consisting essentially of calcium cyanamide, ammonia and carbon dioxide at a temperature of at least about 600° C. and a pressure of at least 450 p. s. i. to produce a reaction mass containing at least one member of the group consisting of a guanidine salt and melamine.

Synthetic Resin

U. S. Patent 2,660,573. Williard J. Lentz, Emmaus, and Joseph M. Walters, Allentown, Pa., assignors to Electro-Chemical Engineering & Mfg. Co., Emmaus, Pa., a corporation of Delaware.

As a novel resin the condensation product of furacrolein, furfural and formaldehyde, the mol ratio of furacrolein to furfural being between about 1 to 1 and about 10 to 1, and the mol ratio of furacrolein plus furfural to formaldehyde being between about 0.5 to 1 and about 1.6 to 1.

Stabilized Stains

U. S. Patent 2,657,970. Lawrence Rudick, Longmeadow, Mass., assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A solution comprising dioxane, water, at least one oil-soluble organic dye and from 0.5% to 1.5% by weight of diethyl aminoethanol.

Olefin-Vinyl Acetate Copolymers

U. S. Patent 2,657,188. Walter A Denison, South Charleston, and William N. Stoops, Charleston, W. Va., assignors, by mesne assignments, to Union Carbide and Carbon Corporation, a corporation of New York.

A liquid copolymer of vinyl acetate with a mono-olefin having from two to four carbon atoms, said copolymer containing from 60 to 80% by weight combined vinyl acetate and having an average molecular weight from 350 to 1200.

Zein Solution

U. S. Patent 2,657,148. Joseph R. Ehrlich, New York, N. Y.

A method of making a mixture of water with a zein solution, which consists in dissolving the zein initially in a substantially anhydrous glycol which is a primary solvent for zein, said glycol being substantially nonvolatile at 130° C. under a pressure of 760 mm. of mercury and having a critical peptization temperature whose maximum is minus 40° C. to make an initial substantially anhydrous solution which remains clear and stable at 21° C. for at least six weeks, and then adding water to said initial solution, the water being added sufficiently slowly and with sufficiently vigorous agitation to blend with said initial solution without precipitation of the zein, the weight of the added water being at least 10% of the weight of the mixture and being within the water tolerance of said primary solvent.

Multicolor Coating

U. S. Patent 2,658,002. Melvin Schwefsky, Union N. J., assignor to United Lacquer Mfg. Corp., Linden, N. J., a corporation.

The method of forming a multicolor coating composition comprising providing a plurality of differently colored lacquer portions, mixing each of said portions with an aqueous suspension of a protective colloid at an elevated temperature, diluting each of said mixtures with water and combining said diluted mixtures.

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TECHNICAL Bulletins

PAINTING STEEL

Specifications for the pretreatment of steel prior to painting, and specifications for the application of paints, have been published by the Steel Structures Painting Council, 4400 Fifth Ave., Pittsburgh, Pa.

The Pretreatment Specifications cover the Wetting Oil Treatment, Cold Phosphate Surface Treatment, Basic Zinc Chromate—Vinyl Butyral Washcoat Treatment, and Hot Phosphate Surface Treatment. The four specifications may be obtained for 25 cents each, and the set of four, for 60 cents.

The Detailed Paint Applications Specifications, entitled, "Shop, Field and Maintenance Painting," apply to the necessary painting of all interior or exterior steel surfaces of structures exposed to weather, moisture, condensation, or other corrosive conditions. They are not intended to apply to painting unexposed steel or steel which is enclosed in masonry. The price is 50 cents a copy.

STUDENT BROCHURE

An educational brochure designed to attract students to the paint, varnish and lacquer industry has been prepared by the National Paint, Varnish and Lacquer Association.

Entitled, "Your Brightest Tomorrow", the brochure tells what the industry has to offer to students.

Chapters in the publication include: Unlimited Opportunity, Satisfaction, Recognition of Ability, Future Security and Happiness for You and Yours.

Center section of the brochure contains a personnel chart, showing the many and varied positions in the paint, varnish and lacquer industry and the educational requirements for each position. While the brochure is designed for high school students, the emphasis is on further education, especially in matters relating to the technical phase of the industry.

Brochure may be obtained by sending 10 cents to the Association at 1500 Rhode Island Ave., N. W., Washington 5, D. C.

GRINDING BALLS

Thirty-eight page bulletin describing its industrial porcelains has been released by the McDanel Refractory Porcelain Co., Beaver Falls, Penna.

Included in the publication are descriptions of the firm's viterous porcelain grinding balls, super high density grinding balls and metal covered jars for cradle of roller type laboratory mills.

In addition to specification data and discription of products, literature contains recommendation chart on what type grinding ball touse for particular operations.

ROLLER MILLS

Instruction booklet entitled, "Installation, Operation and Care of Day Roller Mills," is now available without charge from the J. H. Day Company, Cincinnati, O.

Publication describes all three sizes of Day Type-B roller mills and gives complete information on how to keep them operating at peak efficiency.

Frame, rolls, bearings, gears, drive, apron, scraper blades, feed hopper, etc., are explained point by point to give the reader thorough understanding of the equipment.

Write company, care of Dept. 5, 1145 Harrison Ave., Cincinnati 23, O., for copy of booklet.

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LATEX PAINT

Data on Pliolite Latex 160FR, on compounding ingredients and processing techniques, on the handling and storage of the latex, and on properties of latex paints, is included in bulletin just released by the Goodyear Tire & Rubber Company, Inc., Akron 16, O.

Complete formulations, including step-by-step production suggestions, are presented for white and deep tone colors. According to Goodyear, data presented in Techni-guide can be used without alteration in the preparation of quality paints, or it can serve as a valuable guide in directing whatever modifications may be desired by the paint chemist.

INVENTORY CONTROL

Inventory control system installed in a Georgia company's plant is described in new booklet released by Remington Rand Inc., New York, N. Y.

According to the publication, the Savannah Planning Mill in Savannah, Ga., has been able to save personnel, both in the office and the yard through use of the system. The system is also said to have increased business for the firm by aiding in efficient handling of customer inquiries.

The booklet, known as CR 875, "Extra Profits Through Inventory Control," may be obtained by writing to Remington Rand Inc., 315 Fourth Ave., New York 10, N. Y.

ETHYL CELLULOSE

Technical booklet about the use of ethyl cellulose in specialty coatings is now available from the Hercules Powder Company, Wilmington, Del.

According to publication, product is being utilized in coatings for widely different surfaces including plastics such as polystyrene, on rubber, metal, wood, and paper. It is also being used as the base of many liquid adhesives, strippable protective coatings, and gel lacquers.

Booklet contains starting formulations for many of these applications for ethyl cellulose, as well as information about the solvents and stabilizers used in ethyl cellulose coatings.

DISPENSER VALVE

Four-page bulletin recently published by the Risdon Manufacturing Co., Naugatuck, Conn., shows and describes the company's Model JBR valve for aerosol-dispensed products.

The publication illustrates the valve with both photographs and a blueprint drawing. Among features claimed for valve are: resistance to the solvent effects of aerosol propellents, uniform fineness of spray particles, and effectiveness of seal and positive cutoff.

Copies may be obtained by writing Risdon on company letter head.

ETHYL ACETOACETATE

Ethyl acetoacetate is described in booklet just issued by the Carbide and Carbon Chemicals Company, Division of Union Carbide and Carbon Corporation, 30 East 42nd St., New York 17, N.Y.

Available from the Carbon Chemicals, publication lists physical and chemical properties; specifications and shipping data; uses and potential applications for this valuable reactive intermediate are included.

Important ethyl acetoacetate derivatives are used in the manufacture of paint, lacquer, and printing inks.

Chats about Finishes

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by

J. M. SCHANTZ

Manager, Technical Service
Hercules Naval Stores Dept.

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Detailed information on the preparation and properties of these resins is now available. Write to me, or to your nearest Hercules sales office.

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IC53-8

EXHAUSTERS

Ten Torit exhausters are described in a new folder just issued by the Torit Manufacturing Company, 271 Walnut St., St. Paul 2, Minn.

Ranging in capacity from 350 cfm. to 4000 cfm., these exhausters are said to remove fumes, odors, gases, etc., from industrial operations.

Exhausters are made of heavy sheet metal supported on a sheet steel base. Fans are squirrel-cage type, and are not recommended for handling dust laden air. The air intake is on the side and the exhaust may be had in any position specified.

CELLOSOLVE ACETATE

A new technical bulletin on Cellosolve acetate has just been issued by Carbon Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd St., New York N.Y.

Bulletin gives the physical, chemical, and physiological properties of Cellosolve acetate as well as its specifications and shipping information; resin solubilities; and data on its performance in nitrocellulose lacquers.

According to publication, product's solvent properties make it directly applicable for hot spray lacquers and also an ideal solvent for brushing lacquers.

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TALL OIL

(*From page 29*)

nishes is between 20 and 25 gallons. A 4% maleic anhydride modification (based on the tall oil) is recommended for the maleic varnishes, a 10% phenolic modification for the phenolic varnishes. A preferred oil length is probably 20 gallons which gives a nice balance of desirable properties. This seems to be in general agreement with the published literature on the degree of extension of tall oil with DCO to obtain maximum benefits. Thus, both water and alkali resistance are of a high order at this point whereas one or the other falls off in going to lower or higher oil lengths. The insitu method of preparing these varnishes is straight forward and processing times are reasonable. In the case of the maleic varnishes the MA should be added to the tall oil/Castung 403 Z3 blend (contrary to usual practice). Raw material costs for these varnishes are at a minimum. Furthermore, these tall oil/Castung 403 Z3 "insitu" varnishes are fully equivalent in every respect to equivalent varnishes made from commercial resins.

References

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5. "Influence of the Hydroxyl Value On the Properties of Air Drying Alkyd Resins", Mueller, O. P. and Chibnik, S., American Paint Journal, June 11, 1951.
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7. "Tall Oil-Basic Material for the Paint Industry", Doran, A. B., Paint Industry Magazine, April 1953, pages 7-10.

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Gay R. Harrington, director of Devoe & Raynolds, Dies; was 67

Gay R. Harrington, a director of Devoe & Raynolds, Inc., New York, N. Y., died November 30, in Oak Park, Ill.

Mr. Harrington was associated with Devoe & Raynolds for 30 years—as Chicago factory superintendent, general superintendent of plants, and as a director of the corporation.

New Book

What You Should Know about Paint

By E. M. Fisher. Published by Schnell Publishing Co., Inc., 30 Church St., New York 7, N. Y. Price $2.50.

As the author points out in the preface, this book was written with the intention of helping non-technical people engaged in the distribution, sale and use of today's paint products. The pace with which the paint industry has progressed technologically over the past decade has pointed up the need of a reference which presents, in the simplest way possible, the technical developments having taken place during this period and the effect that such developments have had on the various segments of the paint industry.

The first chapter on "Outside House Paints" is particularly informative. The author traces the development the old lead-in-oil line to modern outside house paints. Such factors as vehicles, types of oils used, war-time and post war formulations, pigment/volume concentration (and the effect this particular property has on the quality and performance of paints) are covered in detail.

Subjects of a technical nature are treated in a very unique and understandable manner. For example, in discussing Synthetic Resins (other than those used in varnishes), the author explains the process of polymerization in very simple terms.

Latex and water-thinned paints are given considerable attention in view of their present-day popularity. Here, the author gives much helpful information on the proper application and use of these products. Chapters dealing with surface treatments, primers and metal protective paints are also presented and should be helpful to dealers in recommending the type of coating, and proper application procedures for specific jobs.

Other subjects covered include pigment properties, white and extender pigments, colored pigments, varnishes, mildew prevention and the moisture problem.

CLASSIFIED ADVERTISEMENTS

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take semi-gloss production out of the "critical" range...

give you easy, accurate, reliable control of sheen.

It is no secret that accurate control of sheen is the most difficult part of manufacturing quality eggshell and semi-gloss paints. One particular property of DICALITE is that its action in controlling sheen is not critical or "sensitive." The disadvantage of flatting by variation of prime pigment volume is that only a slight increase makes the gloss drop sharply and has a bad effect on washability and leveling properties as well. Replacing part of the prime pigment with DICALITE L-5 (a typical popular extender) gives a "slower" and more effective action, besides improving washability and leveling. DICALITE does not lessen, but truly extends the hiding power of prime pigments, and strengthens the paint film because of its unique diatom structure.

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ADVERTISERS' INDEX

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